205

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Aircastle	652.6T1E, V	205-2
Artone	AR21, ARC21, ARD21, AR71, ARC71 Tel. Rec.	205-3
Collaro	RC.521, RC.522, 3RC.521, 3RC.522 Record Changer	205-4
Coronado	25TV2-43-9045C, 25TV2-43-9060B Tel. Rec. Prod. Chg. Bul. 68	205-1
Hoffman	7B110B (Ch. 200, 210, M), 7B113 (Ch. 202), 7M109 (Ch. 200), 7M109B (Ch. 210, M), 7M112 (Ch. 202), 7P111B (Ch. 210, M), 21M305 (Ch. 201) Tel. Rec.	205-5
Magnavox	Ch. CT362, CT363, CT372, CT373 (105L, M, N Series) Tel. Rec.	205-6
RCA Victor	2ES3, 2ES31, 2ES38 (Ch. RS-142)	205-7
Roland	5T1E	205-8
Sentinel	1U462, 1U463, 462, 463 (Ch. 2WA) Tel. Rec.	205-9
Silvertone	1161-17 (Ch. 110.702-10), 1171-17 (Ch. 110.702-10, -50) Tel. Rec.	205-10
Truetone	D2325-A	205-11
Web-Cor	B-134-1, F-134-1	205-12
Westinghouse	H-400P4, H-401P4, H-402P4, H-403P4 (Ch. V-2164-2)	205-13
Westinghouse	H-730C21 (Ch. V-2218-2) Tel. Rec. Prod. Chg. Bul. 68	205-1

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DENVER, COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET #199

CORONADO MODELS 25TV2-43-9045C, 25TV2-43-9060B

Coronado Models 25TV2-43-9045A, B and 25TV2-43-9060A are covered in Photofact Folder 5, Set 199.

In later production the model designation was changed to 25TV2-43-9045C and 25TV2-43-9060B. Models 25TV2-43-9045C and 25TV2-43-9060B are identical to the models covered in Photofact Folder 5, Set 199, except for the following.

The vertical oscillator and vertical output tube (V16) was changed from a type 6BL7 to type 6SN7-GTA. In the new circuit the following changes were made in the value of the associated components.

R82 was changed from 1500Ω to 820Ω.

R83 was changed from 1Meg to 2.2Meg.

R84 was changed from 15KΩ to 6.8KΩ.

A partial schematic showing the revised circuit is given on the reverse side.

In addition some late production sets use a different power transformer (part #53X331). This transformer is identical to the one originally used (part #53X324),except the rectifier tube (V22) and socket are mounted in the top cover of the transformer.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 16 IN SET #190

WESTINGHOUSE MODEL H-730C21 (Ch. V-2218-2)

Ch. V-2218-2

In later production of Westinghouse Model H-730C21, Chassis V-2218-2 is used.

Chassis V-2218-2 is identical to Ch. V-2218-11, covered in Photofact Folder 16, Set 190, and Production Change Bulletin 59, Set 193-1, except for the following:

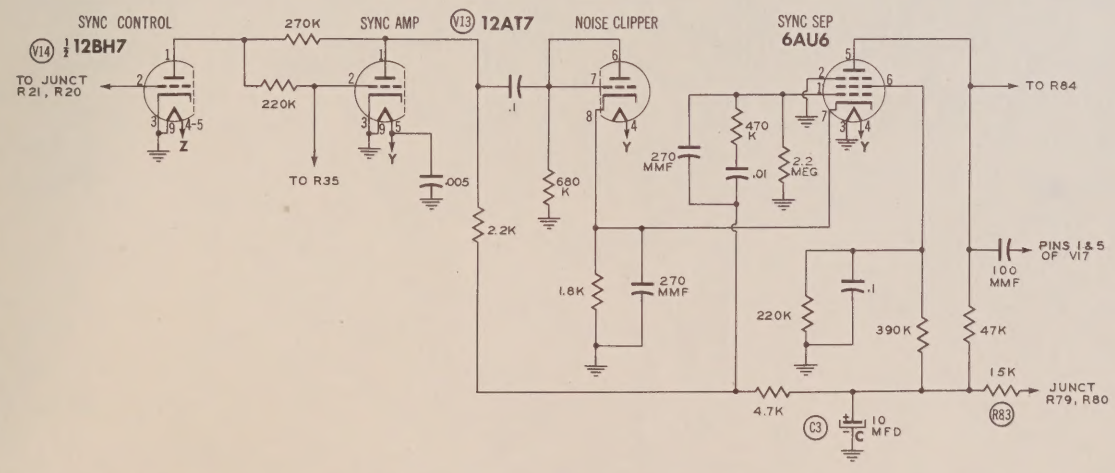
A revised Sync Circuit is used in Ch. V-2218-2. In the new circuit V16, the 6C4 Horiz. Sync Clipper, is omitted and the 1/2 of the 12BH7 (V14), which was used as a noise clipper, is used as a sync control tube. A 6AU6 tube was added as Sync Separator. A partial schematic, showing the revised circuit, is given below.

In addition to the above the following changes were made in the Video Output Circuit.

R38 was changed from 100KΩ to 68KΩ.

R40 was replaced with two 8.3KΩ resistors in parallel.

R43 was changed from 100KΩ to 220KΩ.



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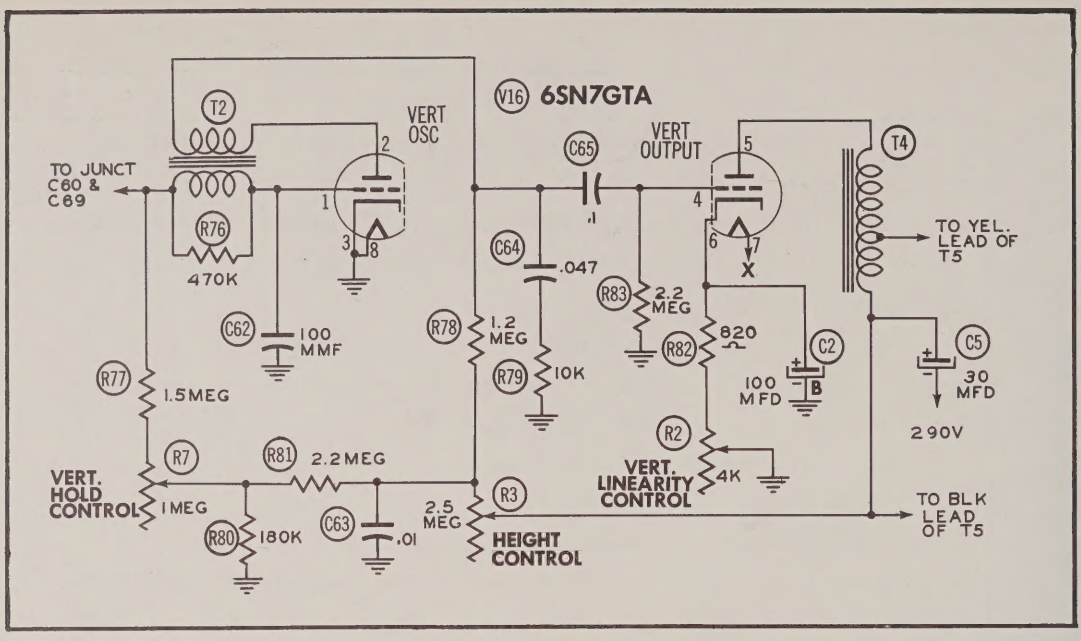
V16 6SN7GTA
T2
VERT OSC
TO JUNCT C60 & C69
R76
470K
C62
100 MMF
R77
1.5MEG
R7
VERT. HOLD CONTROL
1 MEG
R81
2.2MEG
R80
180K
C63
.01
C65
.1
VERT OUTPUT
C64
.047
R78
1.2 MEG
R79
10K
2.5 MEG
R3
HEIGHT CONTROL
R83
2.2 MEG
R82
820
R2
4K
VERT. LINEARITY CONTROL
C2
100 MFD
B
T4
TO YEL. LEAD OF T5
C5
30 MFD
290V
TO BLK LEAD OF T5

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DENVER, COLORADO

AIRCASTLE
MODELS 652.6T1E, V

AIRCASTLE
MODELS 652.6T1E, V

TRADE NAME	Aircastle Models 652.6T1E, 652.6T1V
SUPPLIER	Spiegel, Inc., 1061 W. 35th. St., Chicago 9, Ill.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 6BJ6 RF Amp., 12BE6 Conv., 6BJ6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier

POWER SUPPLY 110-120 Volts AC-DC RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST 540-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tuning gang fully closed and set pointer $1\frac{1}{2}$ inches from left edge of dial backplate.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1610KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6, A7	Adjust for maximum output while rocking tuning gang.

Check tracking at 600KC. If necessary bend outer rotor plates of antenna and RF section of tuning gang for optimum tracking, then repeat steps 2 and 3.

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 652.6T1E

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	6BJ6	6BJ6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	6BJ6	6BJ6	7BK	
V4	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V5	Audio Output	50C5	50C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/40-		EDL44215		3N532	TVA-3451	Red
B	40	150	CE-1000	40-40						Blue
C	20	150								Yellow
C2	5000		CC-5K	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C3	.05	400	CP-503-4	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C4	220	500	CM-221		D6-221		GP2K-221			
C5	.01	600	CP-103-6	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C6	220	500	CM-221		D6-221		GP2K-221			
C7	.01	600	CP-103-6	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C8	.002	600	CP-202-6	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C9	.01	600	CP-103-6	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.01	600	CP-103-6	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C11	.1	400	CP-104-4	P488-1	DF-104	PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	VCD-200S	QJ-45*R*			UF55A	Volume-Panel
B	500KΩ	½					UR55L	Tone-Rear
C	Switch						US-26	Attach to R1A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B13-133 & P1-102 (Panel) B11-133 & R2-119 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	NOTES
R2	220Ω	½		BTS-220	Note 1
R3	470KΩ	½		BTS-470K	
R4	2200Ω	½		BTS-2200	
R5	10KΩ	½		BTS-10K	Note 2
R6	68Ω	½		BTS-68	
R7	2.2Meg	½		BTS-2.2Meg	

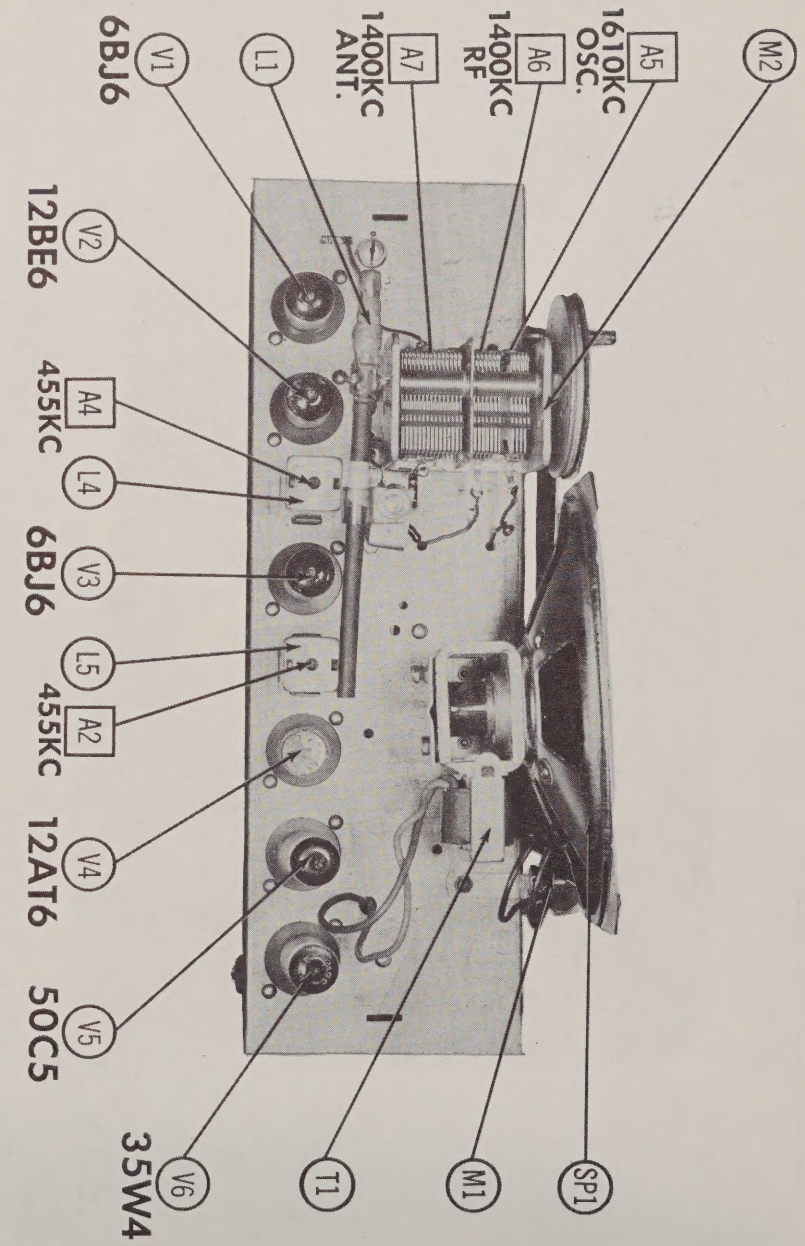
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	NOTES
R8	4.7Meg	½		BTS-4.7Meg	
R9	220KΩ	½		BTS-220K	
R10	150Ω	1		BTA-150	
R11	18Ω	½			
R12	330Ω	1		BTA-330	
R13	2200Ω	1		BTA-2200	

Note 1. Some models use a 68Ω resistor in this application.
Note 2. Some models use a 22KΩ resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.3KΩ	3.2Ω	196Ω	.63Ω	P-70	A-3332 ①	A-3025 ①	RO-2 ①	S-IX ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.2Ω	SP-47	46J6	46A07	

COILS (RF-IF)

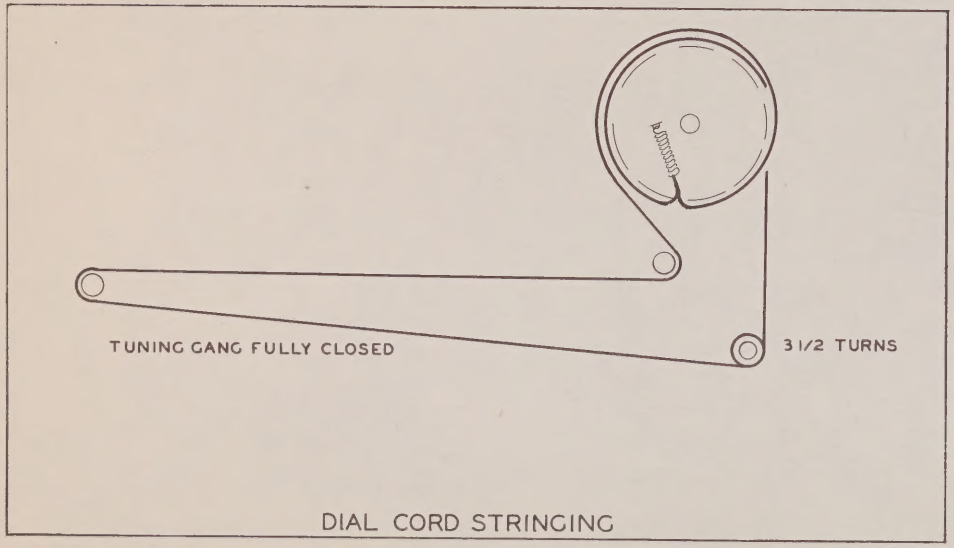
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	.8Ω		LPFE-11A			
L2	RF Coil	9Ω	8.5Ω	LC-12		14-1072	
L3	Osc. Coil	1Ω	9Ω	LC-11			
L4	Input IF	20Ω	20Ω	LF-50	12-C1	16-6758	
L5	Output IF	20Ω	20Ω	LF-50	12-C2	16-6758	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M1	Bayonet	6-8	.15	Brown	BU-47		

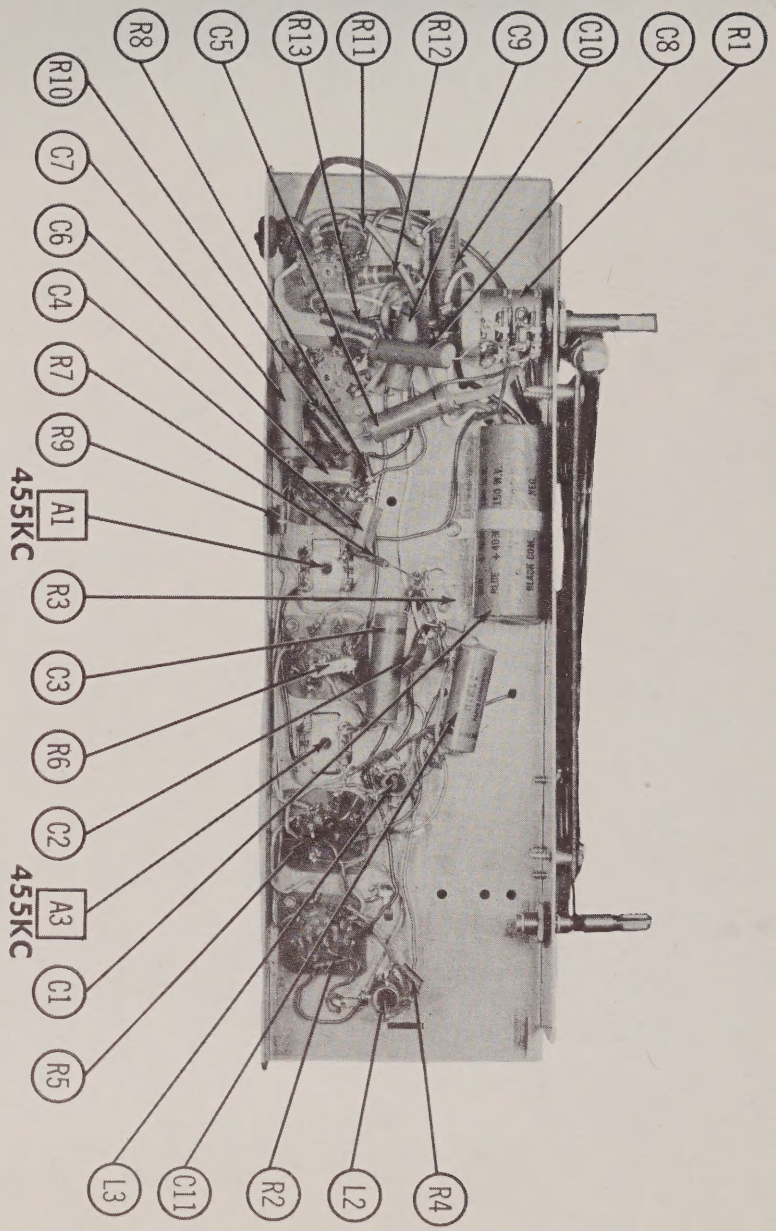
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M2	Tuning Capacitor	CV-22A	37-517MMF, 15-223MMF, 10-87MMF
	Cabinet	CB-TA	
	Back Cover	BC-5201-1	
	Dial Escutcheon	DL-60	
	Knob	KN-6405-3-830	Volume
	Knob	KN-702-10-910	Tone
	Knob	KN-6505-1	Tuning



DIAL CORD STRINGING

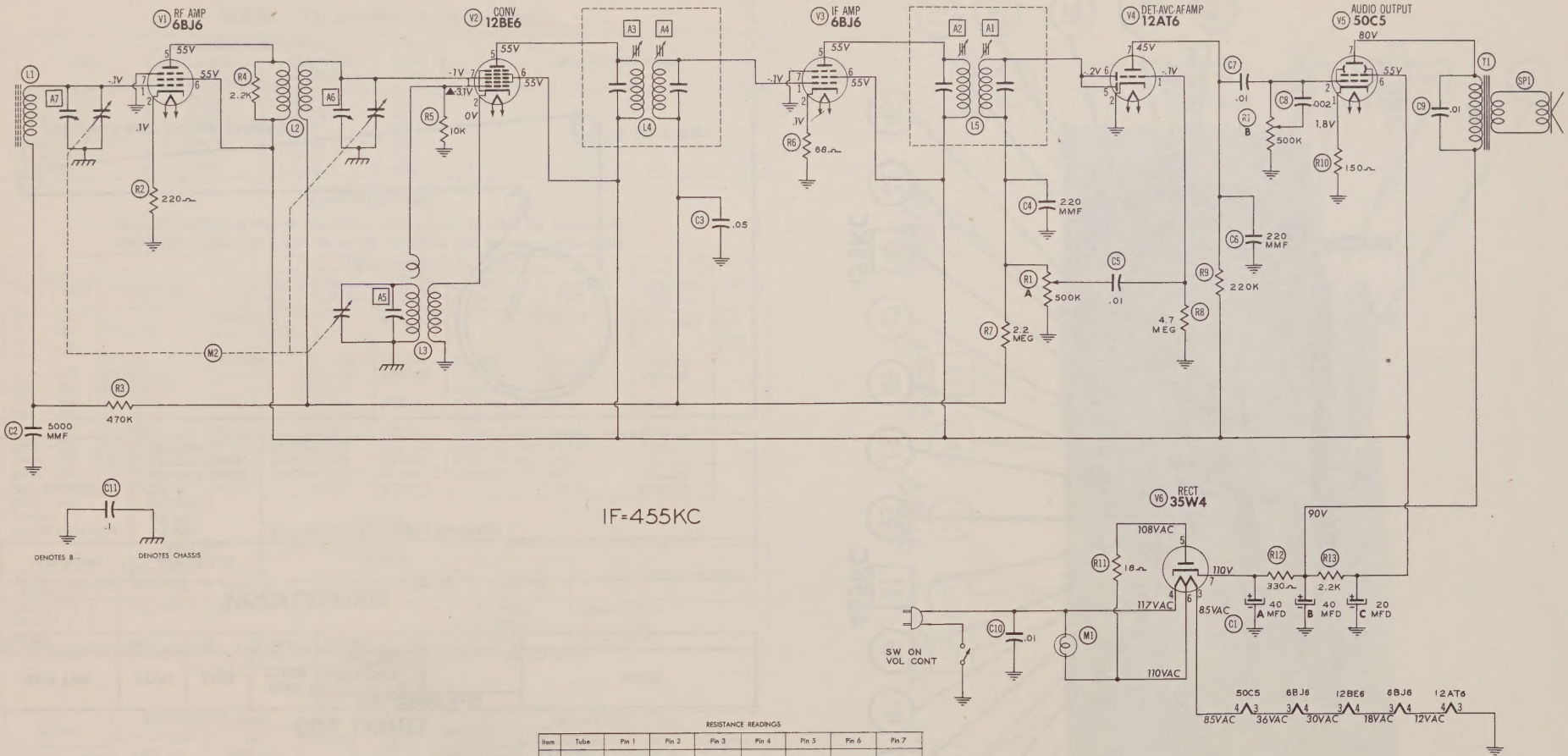
CHASSIS—BOTTOM VIEW



SET 205 FOLDER 2

AIRCASTLE MODEL 652.6TIE

AIRCASTLE MODEL 652.6TIE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BJ6	3.2Meg	220Ω	36Ω	30Ω	†2.5KΩ	†2.5KΩ	0Ω
V 2	12BE6	10KΩ	1Ω	30Ω	18Ω	†2.5KΩ	†2.5KΩ	2.7Meg
V 3	6BJ6	2.7Meg	68Ω	18Ω	12Ω	†2.5KΩ	†2.5KΩ	0Ω
V 4	12AT6	4.7Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†220KΩ
V 5	50C5	150Ω	500KΩ	36Ω	85Ω	500KΩ	†2.5KΩ	†525Ω
V 6	35W4	†2.5KΩ	INF	85Ω	120Ω	130Ω	113Ω	150KΩ

▲ TAKEN WITH VACUUM TUBE VOLT METER
† MEASURED FROM PIN 7 OF V6

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

ARTONE MODELS
AR21, ARC21, ARD21, AR71, ARC71

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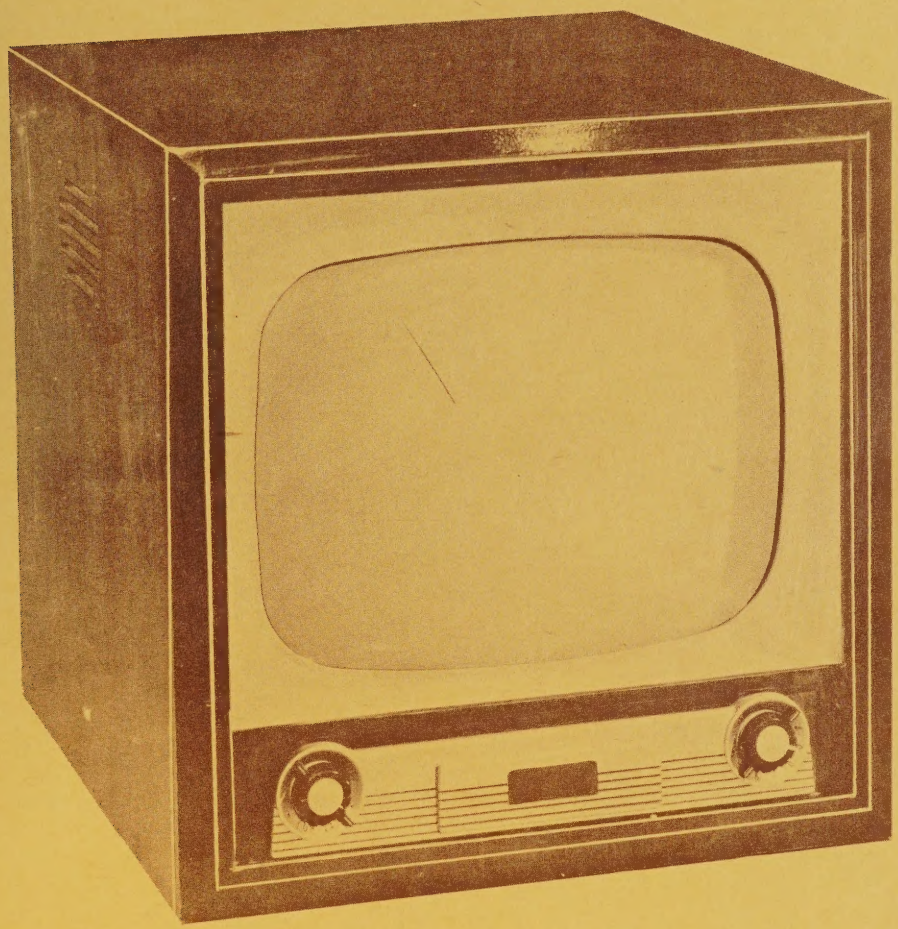

ARTONE MODELS
AR21, ARC21, ARD21, AR71, ARC71

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DATE 6-53 SET 205 FOLDER 3

PHOTOFACT* Folder
*TRADE MARK

ARTONE MODELS
AR21, ARC21, ARD21, AR71, ARC71

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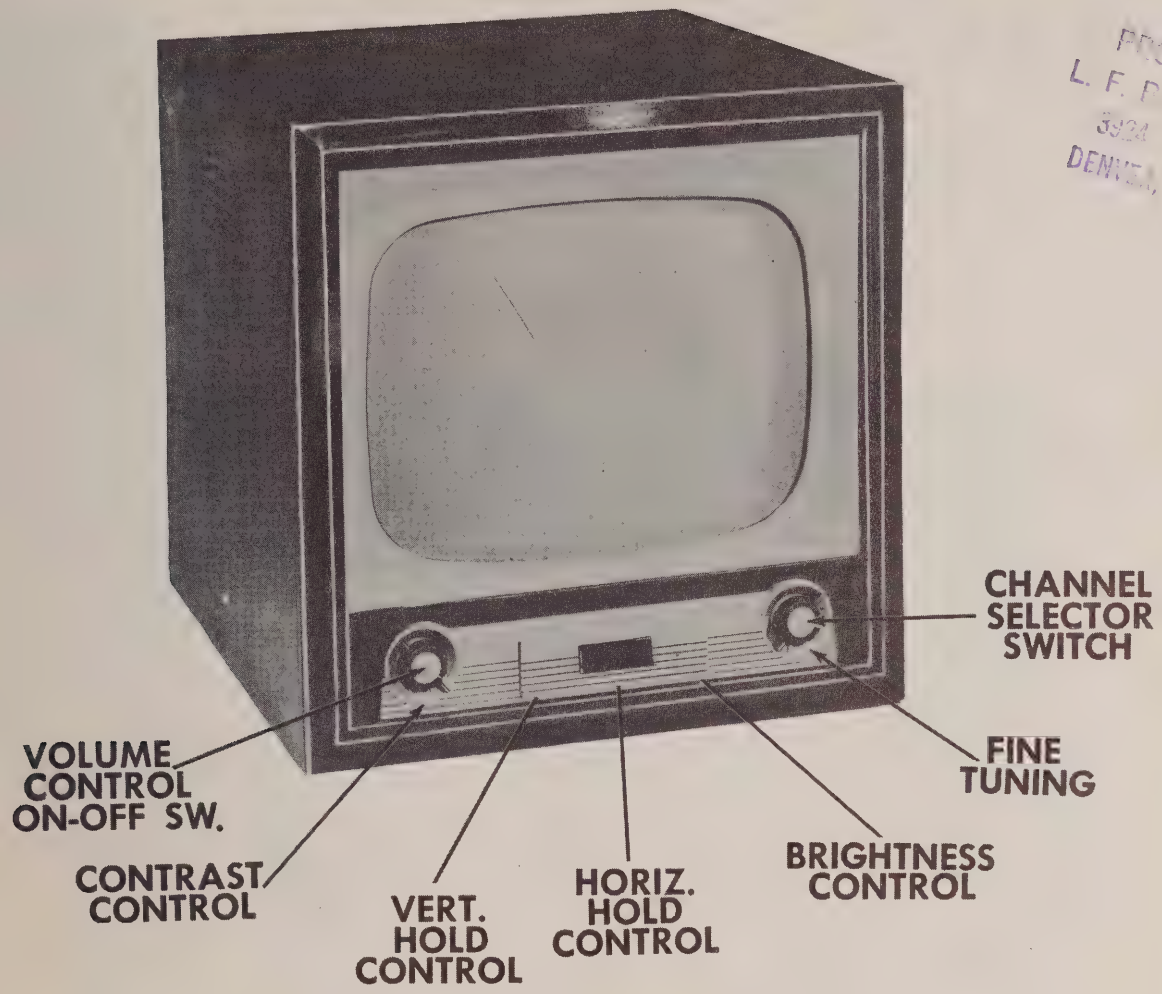

ARTONE MODELS
AR21, ARC21, ARD21, AR71, ARC71

TRADE NAME	Artone Models AR21, ARC21, ARD21, AR71, ARC71.
SUPPLIER	Affiated Retailers, 855 Ave. of America, New York, N.Y.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.42 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.1 MC, Sound IF 20.6 MC (Intercarrier)

INDEX

Alignment Instructions 6
Horizontal Sweep Circuit Adjustments..... 10
Parts List and Descriptions 12, 13, 15
Photographs
Capacitor and Alignment Identification 4, 9
Chassis - Rear View..... 10
Chassis - Top View 3
RF Tuner 7
Photographs (Cont.)
Resistor and Inductor Identification. 11, 14
Resistance Measurements 8
Schematic..... 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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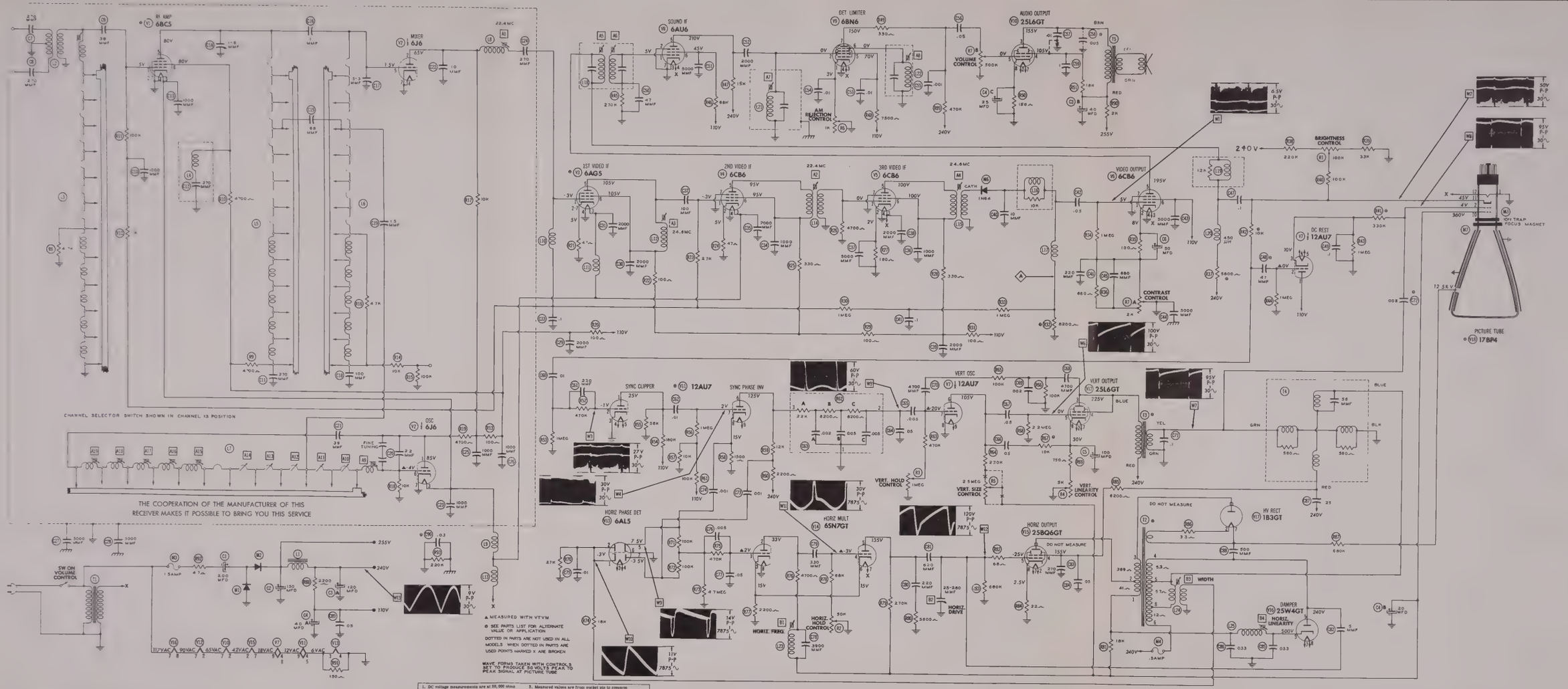
RF AMP 6BC5
MIXER 6J6
OSC 6J6
SOUND IF 6AU6
DET LIMITER 6BN6
AUDIO OUTPUT 25L6GT
1ST VIDEO IF 6AG5
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
VIDEO OUTPUT 6CB6
SYNC CLIPPER 12AU7
SYNC PHASE INV
VERT OSC 12AU7
VERT OUTPUT 25L6GT
HORIZ PHASE DET 6AL5
HORIZ MULT 6SN7GT
HORIZ OUTPUT 25BQ6GT
DC REST 12AU7
HV RECT 1B3GT
DAMPER 25W4GT
PICTURE TUBE 17BP4
VOLUME CONTROL
A.M. REJECTION CONTROL
BRIGHTNESS CONTROL
CONTRAST CONTROL
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT. LINEARITY CONTROL
HORIZ. HOLD CONTROL
HORIZ. FREQ.
HORIZ. DRIVE
HORIZ. LINEARITY
WIDTH
ION TRAP FOCUS MAGNET
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
FINE TUNING
SW ON VOLUME CONTROL
117VAC 90VAC 65VAC 42VAC 18VAC 12VAC 6VAC
240V
DO NOT MEASURE
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
MEASURED WITH VTVM
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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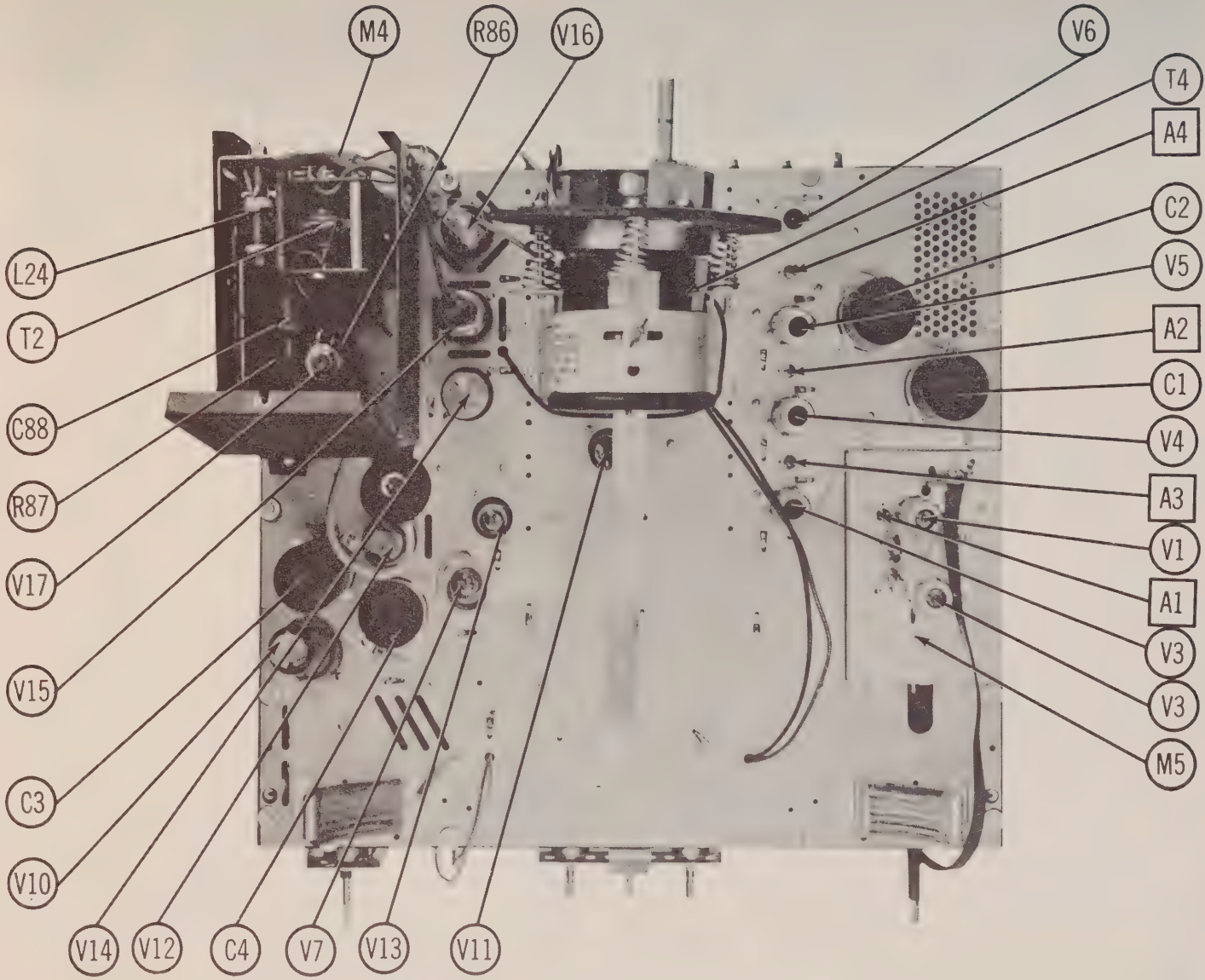
ARTONE
MODELS AR21, ARC21, ARD21, AR71, ARC71

ARTONE
MODELS AR21, ARC21, ARD21, AR71, ARC71



CHASSIS TOP VIEW

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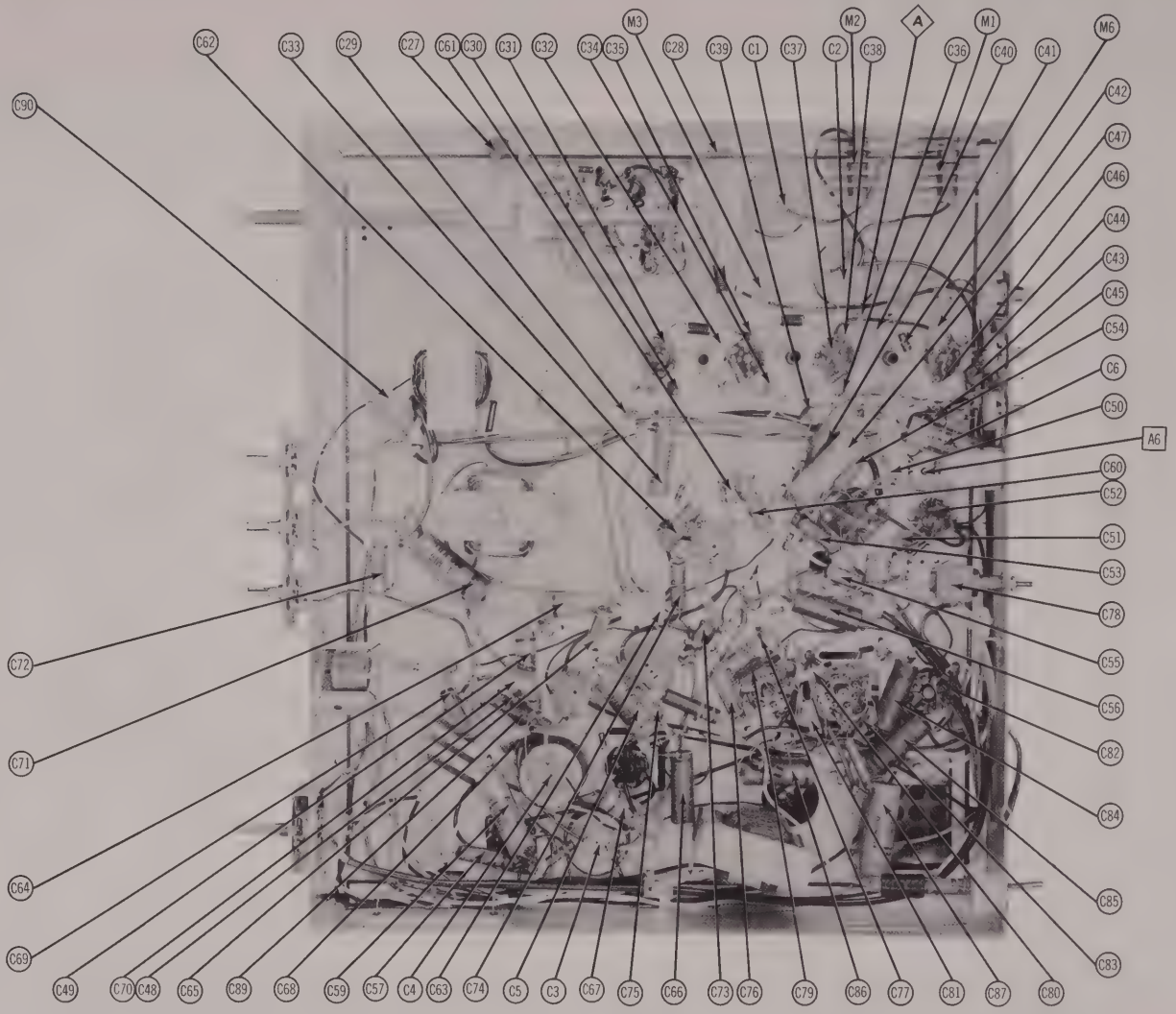
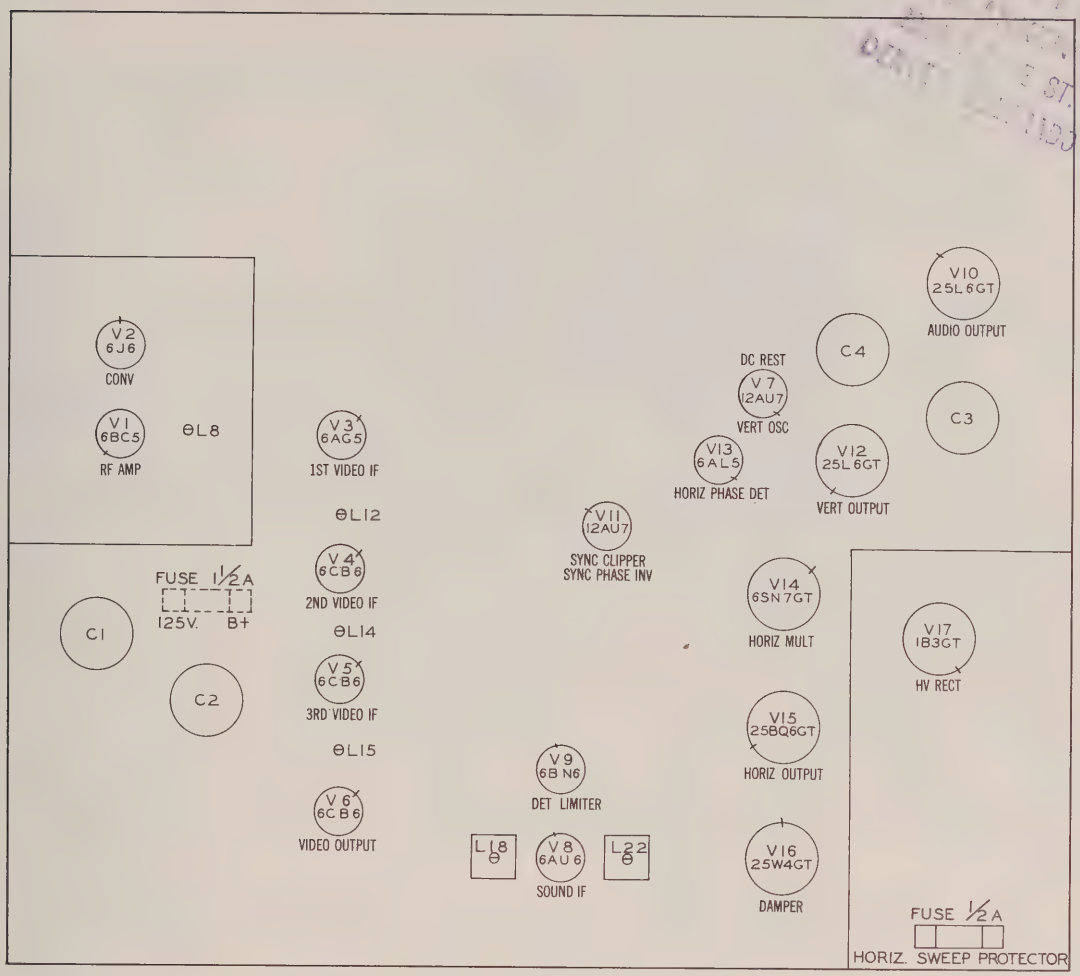


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most liekly to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - Selenium Rectifier (M1, M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V6, V7, V18
Has Pic, No Sound - V8, V9, V10

SYNC FAILURE
No Vert. Sync - V7, V11
No Horiz. Sync - V11, V13, V14
No Vert. or Horiz. Sync - V11, V7

SWEEP FAILURE
No Raster, Has Sound - V14, V15, V16, V17, V18, Fuse (M4)
No Vertical Deflection - V12
Poor Vert. Linearity or Foldover - V12, V7
Poor Horiz. Linearity or Foldover - V14, V15, V16
Narrow Picture - V14, V15, V16, M1, M2
Vert. Off Freq. - V7, V11
Horiz. Off Freq. - V11, V13, V14

NOTE: Since this receiver employs series connected filament, an open filament in any tube in series may cause the set to be inoperative.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.
Make all test equipment ground returns to B- (top chassis plate).
Use isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to B-.	22.4MC (Unmod.)	Any	DC probe to point (A). Common to B-.	A1, A2	Adjust for maximum deflection.
2.	"	"	24.6MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to B-.	24MC (10MC Swp)	20.6MC 22.0MC 25.1MC 26.6MC	Any	Vert. amp. to point (A). Low side to B-.		Check for response curve similar to fig.1 If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Tune in a TV station and connect an attenuator in series with the antenna.
Attenuate the input until the sound signal drops below the limiting level of the 6BN6 as indicated by a hiss similar to superregeneration.
Adjust the sound take-off transformer (A5 and A6) for maximum audio.
Adjust A7 for maximum audio signal regardless of hiss or buzz. If during the above adjustments the signal rises above the limiting level as indicated by the disappearance of the hiss, reduce the signal input until the hiss returns.
When maximum sound output has been reached through adjustment of A5, A6 and A7 increase the signal input to the point where the hiss disappears and adjust A8 for maximum sound output.
Adjust the AM rejection control R6 for minimum intercarrier buzz, then repeat the adjustment of A8 and R6.

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
There is no individual oscillator adjustment for channel 7 as the alignment for channel 8 assures proper alignment of channel 7 oscillator.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. to point (A). Low side to B-.	A9	Adjust to place video marker at 50% on response curve as per fig. 2.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A15	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A16	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A17	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A18	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A19	

The RF and Mixer portion of this tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

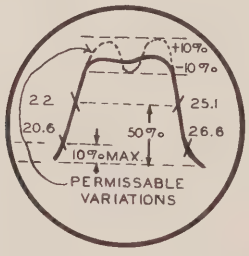


FIG.1

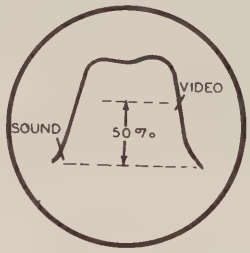
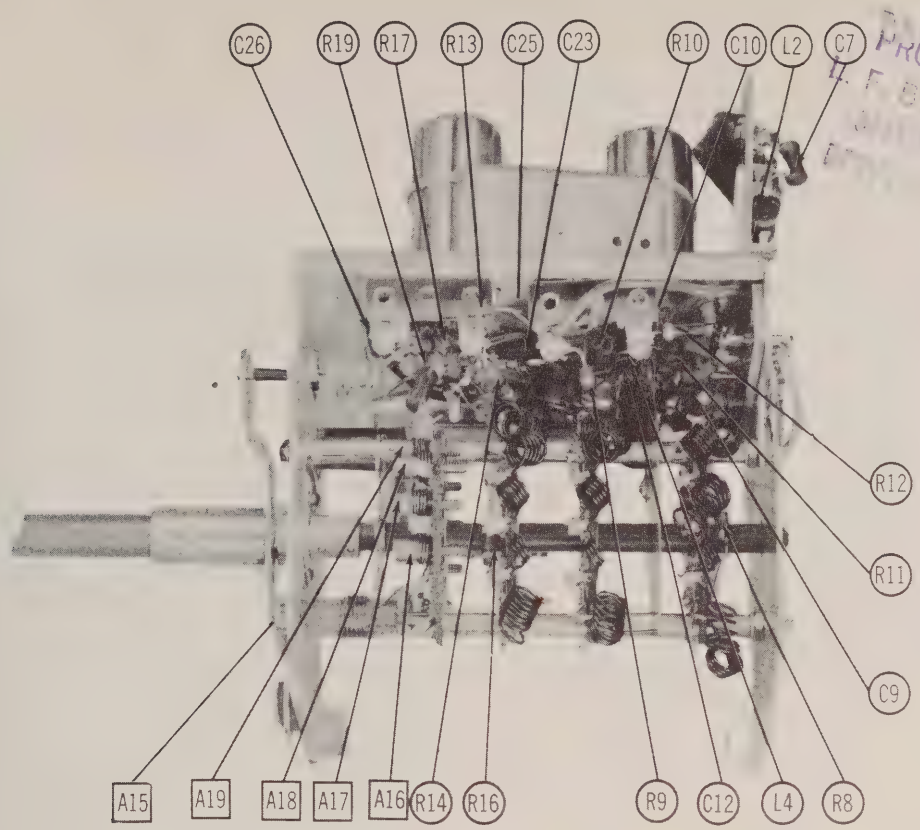
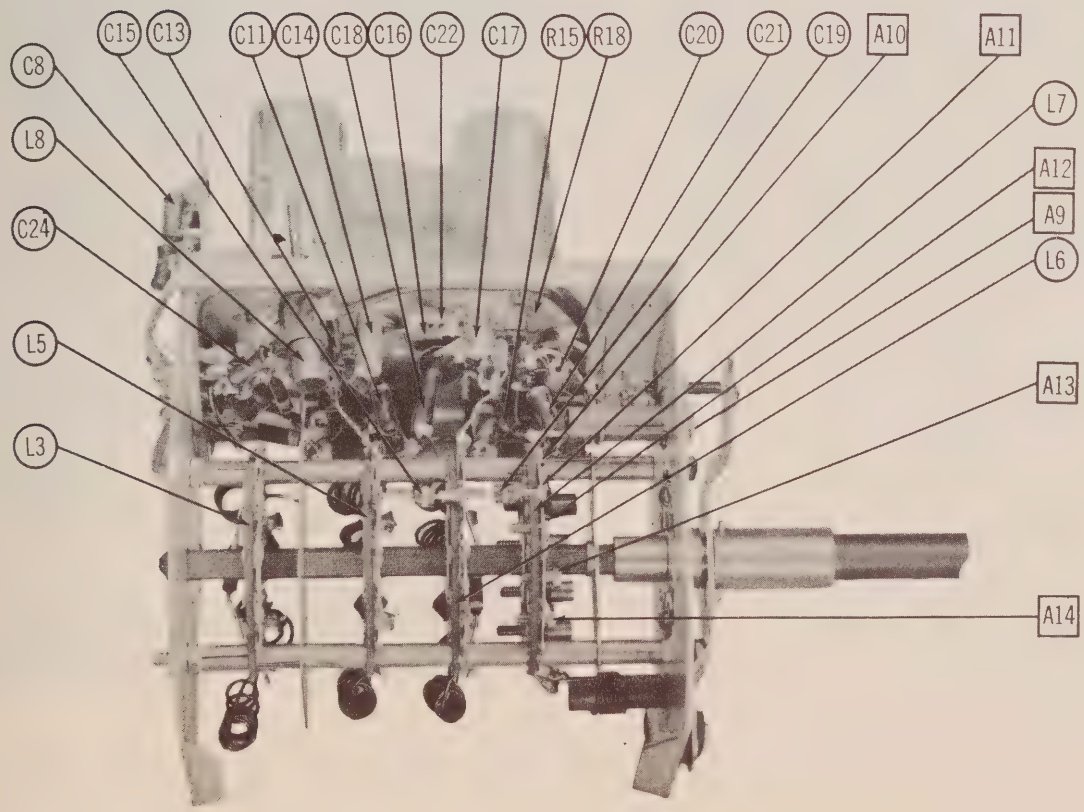


FIG.2



RF TUNER-RIGHT SIDE

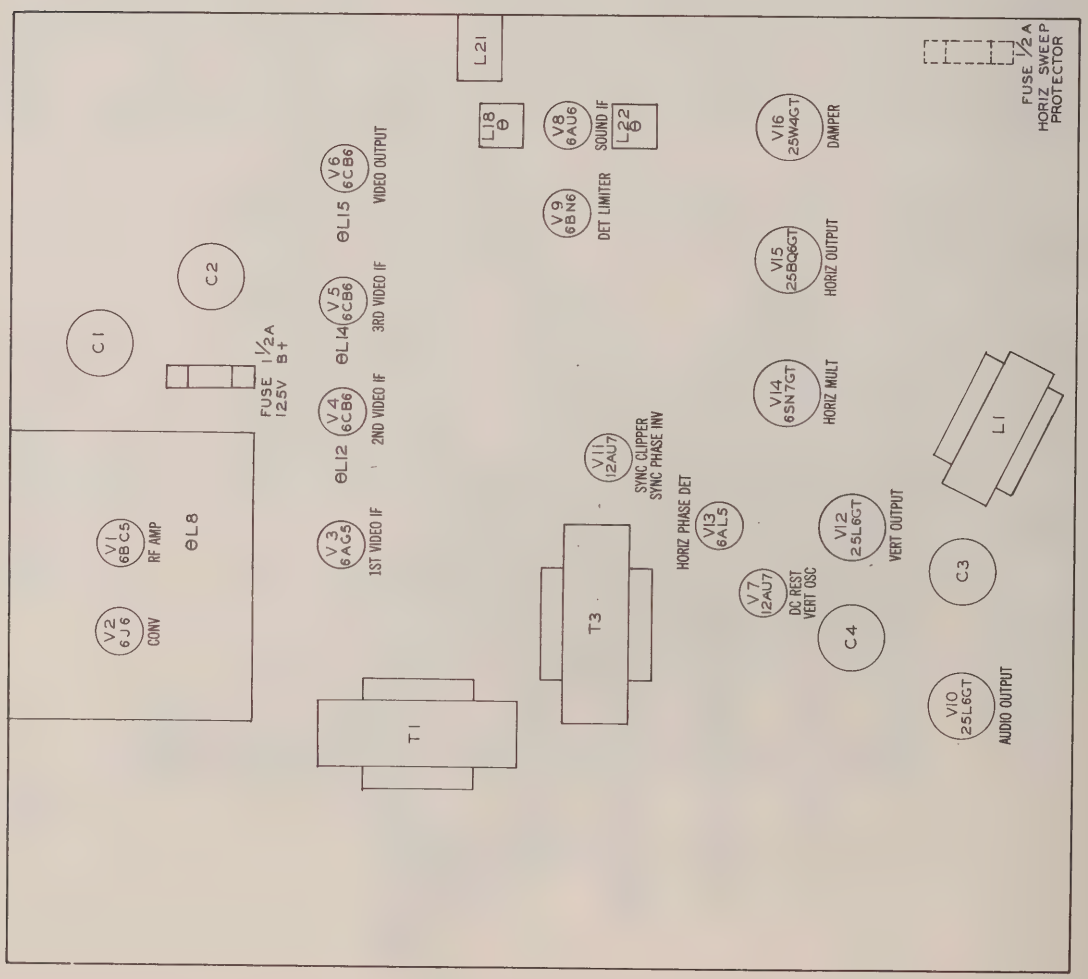


RF TUNER-LEFT SIDE

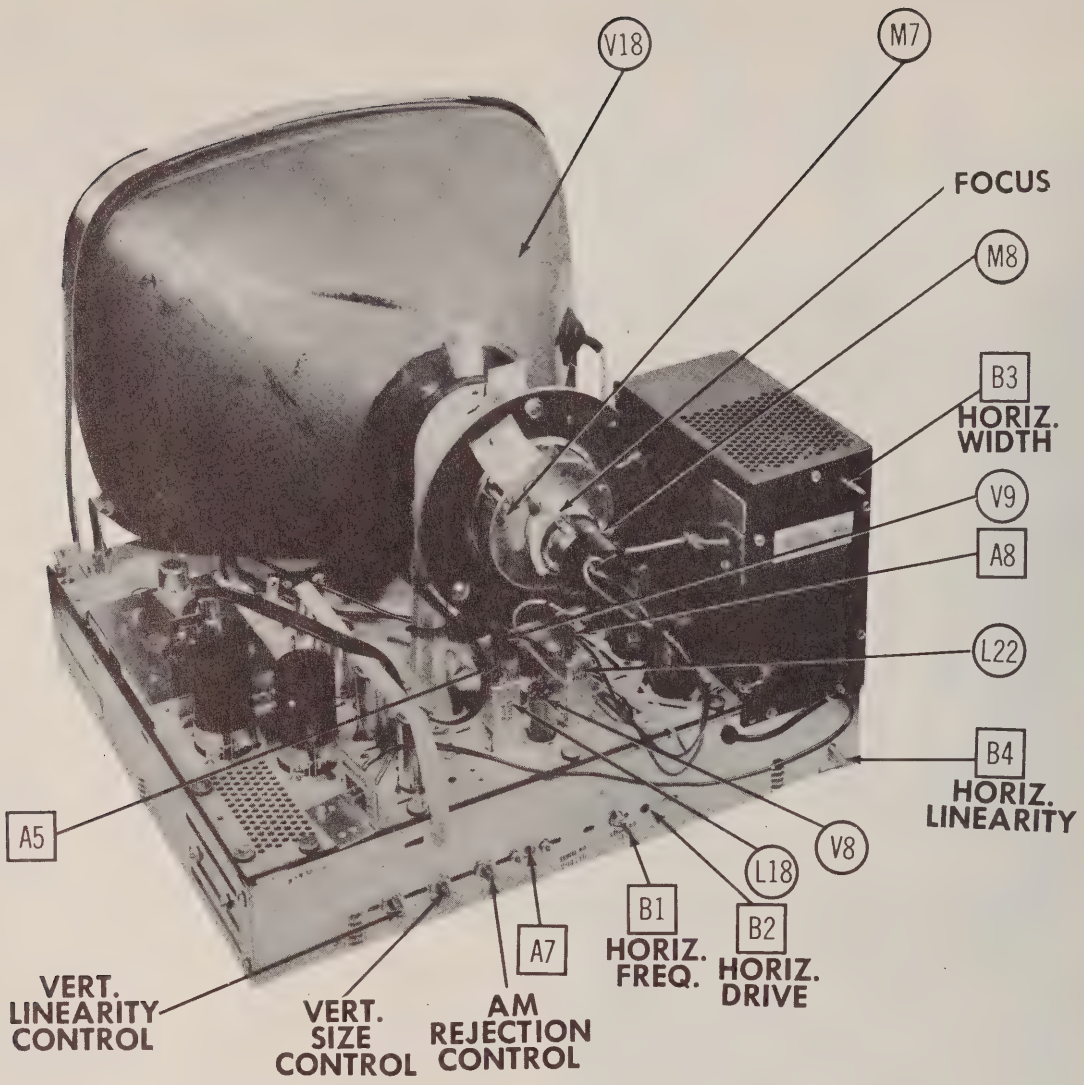
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	2.1Meg	0Ω	.1Ω	0Ω	†7.1KΩ	†7.1KΩ	0Ω		
V 2	6J6	†7.2KΩ	†12KΩ	.1Ω	0Ω	110KΩ	10KΩ	0Ω		
V 3	6AG5	2Meg	47Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	47Ω		
V 4	6CB6	2Meg	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	.2Ω	180Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	1Meg	1KΩ	.1Ω	0Ω	†5.7KΩ	†2.3KΩ	0Ω		
V 7	12AU7	†2.3KΩ	1Meg	1Meg	8Ω	8Ω	#1.7Meg	1Meg	0Ω	9Ω
V 8	6AU6	270KΩ	0Ω	0Ω	.1Ω	†15KΩ	†68KΩ	0Ω		
V 9	6BN6	400Ω	1.9Ω	.1Ω	0Ω	†9.8KΩ	22Ω	†470KΩ		
V 10	25L6GT	INF	16Ω	†2.3KΩ	†20KΩ	180KΩ	INF	19Ω	150Ω	
V 11	12AU7	56KΩ	1.5Meg	0Ω	4Ω	4Ω	†14KΩ	1Meg	1.5KΩ	8Ω
V 12	25L6GT	INF	19Ω	†785Ω	†785Ω	2.2Meg	#1.5Meg	21Ω	1KΩ	
V 13	6AL5	12KΩ	12KΩ	4Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 14	6SN7GT	5.1Meg	#22KΩ	2.2KΩ	100KΩ	#290KΩ	2.2KΩ	.1Ω	0Ω	
V 15	25BQ6GT	0Ω	16Ω	INF	†6.3KΩ	680KΩ	56KΩ	9Ω	22Ω	TOP CAP #68Ω
V 16	25W4GT	INF	INF	1.8Meg	INF	†90Ω	1.8Meg	19Ω	21Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP #437Ω
V 18	17BP4	0Ω	1.3Meg	PIN 10 #18KΩ	PIN 11 160KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M 2
# MEASURED FROM PIN 3 OF V16



TUBE PLACEMENT CHART



CHASSIS – REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

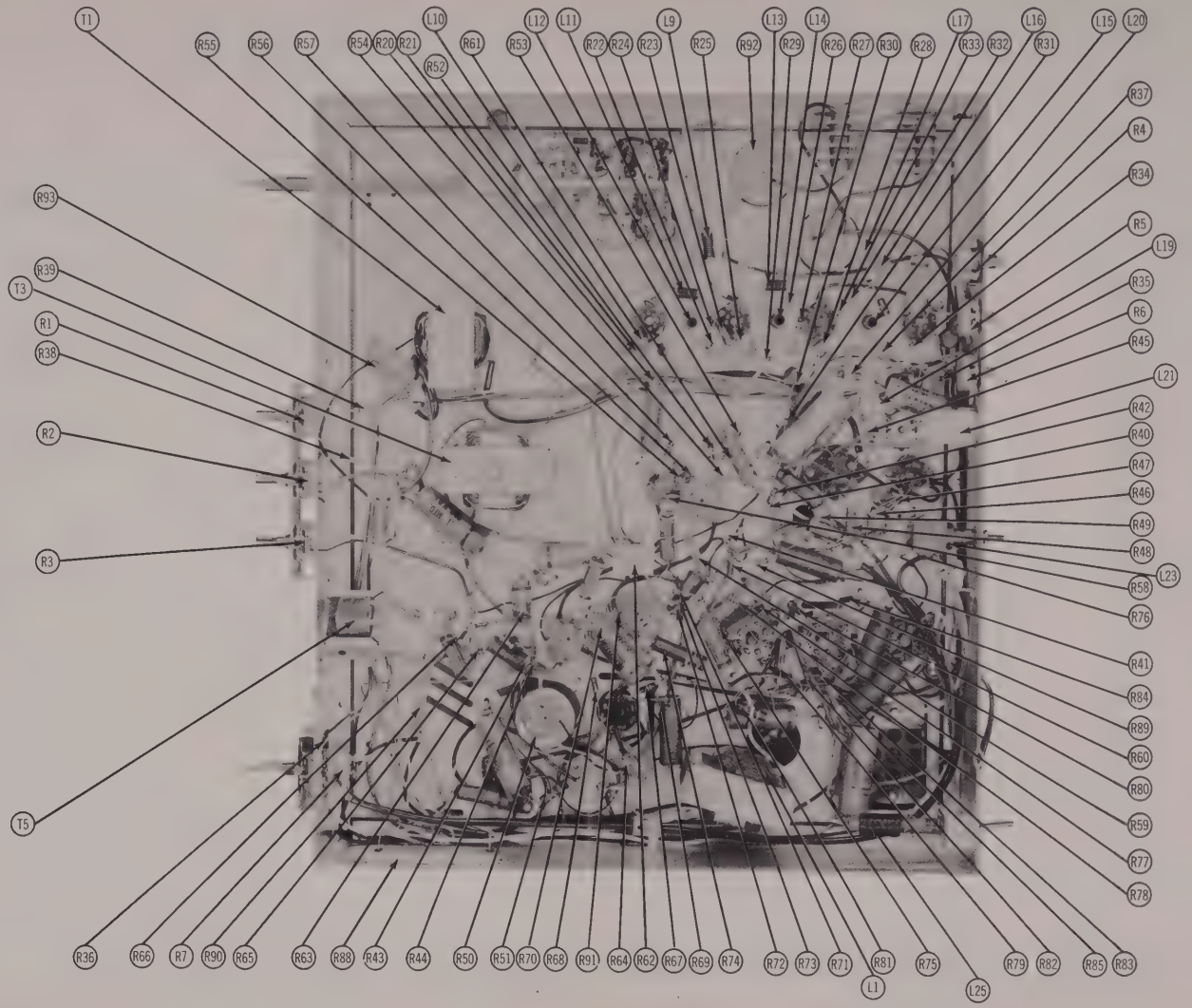
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) for the best compromise between brightness and horizontal linearity.

Adjust the width slug (B3) for a picture slightly wider than enough to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

Slight readjustment of B2 may be necessary for optimum results .



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BC5	6BC5	7BD	
B	RF Amplifier	6AG5	6AG5	7BD	
C	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3A	1st. Video IF Amp.	6AG5	6AG5	7BD	
B	1st. Video IF Amp.	6BC5	6BC5	7BD	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6CB6	6CB6	7CM	
V7	DC Restorer- Vert. Oscillator	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AU8	6AU6	7BK	
V9	Detector - Limiter - AF Amplifier	6BN6	6BN6	7DF	
V10	Audio Output	25L6GT	25L6GT	7AC	
V11A	Sync Clipper - Sync Phase Inv.	12AU7	12AU7	9A	
B	Sync Clipper - Sync Phase Inv.	12AT7	12AT7	9A	
V12	Vert. Output	25L6GT	25L6GT	7AC	
V13	Horiz. Phase Det.	6AL5	6AL6	6BT	
V14	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V16	Damper	25W4GT	25W4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: SYLVANIA Part No.	RTMA BASE TYPE	NOTES
V18A	17BP4	17BP4	12D	① Circuit changes necessary
		17BP4A	12D	② 3/8" longer
		17HP4 ①	13C	
		17HP4A ①	13C	
B	17CP4	17CP4	12D	
C	17RP4	17RP4 ①	13C	
		17EP4 ①	13C	
D	20BP4	20BP4	12D	
E	20CP4	20CP4	12D	
		20CP4A ①	12D	
		20DP4 ① ②	12D	
		20DP4A ②	12D	
		20HP4 ① ②	13C	
		20HP4A ① ②	13C	
		20LP4 ① ②	12C	
		20MP4 ① ②	13C	
F	20RP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C1	200	150	CEM-9-E	AFM2-22				FP19	TVL-1431	
C2	150	300	CEM-10-E					FP229.3	TVL-1584	
C3A	▲60	300	CEM-11					FP40	TVL-3985	
B	▲40	300						TC78		
C4A	▲40	450	CEM-12	AFH4-67		UP4245C		FP346	TVL-4729	
B	▲20	450								
C	▲25	25								
C5	100	25	CET-5	PRS25/100		BRH251A		TC2501	TVA-1207	
C6	50	25	CET-8	PRS25/50		BR502A		TC502	TVA-1206	
C7	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C8	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C9	39			SI39	D6-390		GP1K-390	UC-5439	5GA-Q39	
C10	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C11	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C12	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C13	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C14	1-8				829-5					
C15	.68				TCZ-.68		NP0K-R68			
C16	1				TCZ-1		NP0K-010		5TCCB-V1	
C17	.5-3				829-3			CT565A		
C18	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C19	1.5			SIL5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C20	2.2						N750K-2R2			
C21	39			SI39	D6-390		GP1K-390	UC-5439	5GA-Q39	
C22	10			SI10	D6-100		GP1K-100	UC-541	5GA-Q1	
C23	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C25	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	2000		CC-22	BPD-002	DD-202	TM5D2	801-002	DC-523	5HK-D2	
C30	2000		CC-22	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C31	2000		CC-22	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C32	100		CC-21	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C33	.1	200	CP-2-01	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C34	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	2000		CC-22	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C36	1000		CC-21	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C37	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	2000		CC-22	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C39	3000		CC-23	BPD-003	DD-302	TM5D2	801-002	DC-522	5HK-D2	
C40	10		CC-41	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C41	.1	200	CP-2-01	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C42	.05	200	CP-2-15	P288-05	DF-503	PJ2S5		PT415	2TM-S5	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARTONE Part No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C43	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	680		CC-368	SI680	D6-681	2K5T	GP2K-681	UC-5368	5GA-T68	
C46	220		CC-322	SI220	D6-221	5W5T25	GP2K-221	UC-5323	5GA-T22	
C47	.1	600	CP-6-01	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C48	47		CC-447	SI47	D6-470	5W5Q6	GP1K-470	UC-5447	5GA-Q47	Note 1
C49	.1	200	CP-2-01	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C50	47		CC-447	SI47	D6-470	5W5Q5	GP1K-470	UC-5447	5GA-Q47	
C51	5000		CC-25	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C52	2000		CC-22	BPD-002	DD-202	TM5D2	801-001	DC-522	5HK-D2	
C53	.01	600	CP-6-11	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C54	.01	600	CP-6-11	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C55	.001	600	CP-6-21	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C56	.05	600	CP-6-15	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C57	.01	1000	CP-10-11	P1088-01		PTE10S1		PT611	MB-S1	
C58	.005	1000		P1088-005		PTE10D5		PT625	MB-D5	Note 2
C59	.1	600	CP-6-01	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C60	.01	600	CP-6-11	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C61	.220	500	CM-332	1468-00025	D6-221	5W5T25	GP2K-321	MC340	1FM-S25	
C62	.01	600	CP-6-11	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C63A	.002			P688-002		PTE6D2	GP2-333-202	PT622		
B	.005		⋆CRP-3	P688-005	⋆PC-106	PTE6D5	GP2-333-502	PT625	⋆101C1	
C	.005			P688-005		PTE6D5	GP2-333-502	PT625		
C64	.05	600	CP-6-15	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C65	.005	600	CP-6-25	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C66	.05	600	CP-6-15-9	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C67	.05	600	CP-6-15	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C68	4700	800	CM-247A-1							
C69	.002	600	CP-6-22	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C70	4700	800	CM-247A-1							
C71	.1	600	CP-6-01-3	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C72	.002	600	CP-6-23	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	Note 3
C73	.001	600	CP-6-21	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C74	.001	600	CP-6-21	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C75	.01	600	CP-6-11	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C76	.005	600	CP-6-25	P688-005	D6-502	⋆PTE6D5	GP2-333-502	PT625	6TM-D5	
C77	.05	600	CP-6-15	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C78	3900	500	CM-239	1466-004		IDR5D4		MCB463		
C79	330	500	CM-339A	1469-00035						
C80	220	500	CM-322	1469-00025		5R5T25		MCB240		
C81	820	500	CM-382					MCK382		
C82	5	5000	CHV-55-5K							
C83	270	500	CM-327	1468-0003	D6-271	5W5T3	GP2K-271	MC241	MS-33	
C84	.05	600	CP-6-15	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C85	.033	1000	CO-10-13	P1088-033		PTE10S3		TP464	MB-S3	
C86	.033	1000	CO-10-13	P1088-033		PTE10S3		TP464	MB-S3	
C87	.25	400	CP-4-025	P468-25		PTE4P25		TP430	4TM-P25	
C88	500	20000	CHV-20-20A	HV-20C	TV3-502	MM-C20T5			20DX-T5	
C89	.05	200	CP-2-15	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C90	.03	600		P688-03		PTE6S5		PT613	6TM-S3	Note 1

Note 1. Some models use .05MFD in this application (Part #CP-6-15)
Note 2. Not used in all models.
Note 3. Some models use .01MFD in this application (Part #CP-6-11)
⋆ Items C63A, C63C, C63C, R62A, R62B, R62C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ	½	P-15 ‡	Q11-128	AG-49-S	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	50KΩ	½	P-16 ¶	Q11-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1Meg	½	P-13 ⋆	Q11-137	AG-61-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	5000Ω	½	P-3D	Q11-114	AG-19-S	AB-13	SU-16	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg	½	P-5D	Q11-239	AG-84-S	AB-83	SU-585	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1000Ω	½	P-12D	Q11-108	AG-8-S	AB-5		AM Rejection
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1		Attach to R6A
R7A	2000Ω	½	PD-9⋆	QJ-331†				Contrast -Tapped ⑥ 1500Ω - Panel
B	500KΩ	½						Volume & Sw. - rear

‡ Some models use alternate control (part #P-19-B)
¶ Some models use alternate control (part #P-18-B)
⋆ Some models use alternate control (part #P-17-B)
⋄ Some models use alternate control (part #PD-10-A)
† CONCENTRIKIT EQUIVALENT, KIT K-2, BASE ELEMENTS & SHAFTS B17-110X & P2-031 (Panel) B13-133 & R1-115 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R8	4700Ω	½		BTS-4700	Antenna Coil Shunt
R9	4700Ω	½		BTS-4700	RF Amp. Plate
R10	4700Ω	½		BTS-4700	RF Amp. Screen
R11	100KΩ	½		BTS-100K	RF Amp. Grid
R12	1000Ω	½		BTS-1000	AGC Network
R13	100Ω	20W		BTS-100	Decoupling
R14	10KΩ	½		BTS-10K	Mixer Grid
R15	100KΩ	½		BTS-100K	Mixer Grid
R16	4700Ω	½		BTS-4700	Mixer Grid Coil Shunt
R17	10KΩ	½		BTS-10K	Mixer Plate
R18	10KΩ	½		BTS-10K	Osc. Grid
R19	4700Ω	½		BTS-4700	Osc. Plate
R20	100Ω	½	RC-101-2	BTS-100	Decoupling
R21	47Ω	½	RC-470-2		1st. Video IF Amp. Cathode
R22	100Ω	½	RC-101-2	BTS-100	1st. Video IF Amp. Decoupling
R23	27KΩ	½	RC-273-2	BTS-27K	2nd. Video IF Amp. Grid
R24	47Ω	½	RC-470-2		2nd. Video IF Amp. Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R25	330Ω	½	RC-331-2	BTS-330	2nd. Video IF Amp. Decoupling
R26	4700Ω	½	RC-472-2	BTS-4700	3rd. Video IF Coil Shunt
R27	180Ω	½	RC-181-2	BTS-180	3rd. Video IF Amp. Cathode
R28	330Ω	½	RC-331-2	BTS-330	3rd. Video IF Amp. Decoupling
R29	100Ω	½	RC-101-2	BTS-100	Decoupling
R30	1Meg	½	RC-105-2	BTS-1Meg	AGC Network
R31	100Ω	½	RC-101-2	BTS-100	Decoupling
R32	8200Ω	½	RC-822-2	BTS-8200	Video Det. Load - See Note 1
R33	1Meg	½	RC-105-2	BTS-1Meg	AGC Network
R34	1Meg	½	RC-105-2	BTS-1Meg	Video Output Grid
R35	100Ω	½	RC-101-2	BTS-100	Video Output Cathode
R36	680Ω	2	RC-681-2	BTS-680	Contrast Control Shunt
R37	5600Ω	2	RC-562-8	BTB-5600	Video Output Plate - See Note 2
R38	220KΩ	½	RC-224-2	BTS-220K	Voltage Divider
R39	33KΩ	½	RC-333-2	BTS-33K	Voltage Divider
R40	100KΩ	½	RC-104-2	BTS-100K	Picture Tube Cathode
R41	330KΩ	½	RC-334-2	BTS-330K	Picture Tube Grid - See Note 3
R42	10KΩ	½	RC-103-2	BTS-10K	Isolation - See Note 3
R43	1Meg	½	RC-105-2	BTS-1Meg	DC Restorer Cathode
R44	1Meg	½	RC-105-2	BTS-1Meg	DC Restorer Grid
R45	270KΩ	½	RC-274-2	BTS-270K	Sound IF Amp. Grid
R46	68KΩ	½	RC-683-2	BTS-68K	Sound IF Amp. Screen
R47	15KΩ	½	RC-153-2		Sound IF Amp. Plate
R48	7500Ω	1	RC-752-5		Det.-Limiter Screen
R49	330Ω	½	RC-331-2	BTS-330	Isolation
R50	150Ω	1	RC-151-5	BTA-150	Output Cathode
R51	18KΩ	1	RC-183-5	BTA-18K	Output Screen
R52	470KΩ	½	RC-474-2	BTS-470K	Isolation
R53	1Meg	½	RC-105-2	BTS-1Meg	Sync Clipper Grid
R54	180KΩ	½	RC-184-2	BTS-180K	Sync Clipper Plate
R55	56KΩ	½	RC-563-2	BTS-56K	Voltage Divider
R56	1Meg	½	RC-105-2	BTS-1Meg	Sync Phase Inverter Grid
R57	10KΩ	½	RC-103-2	BTS-10K	Sync Phase Inverter Grid
R58	1500Ω	½	RC-152-2	BTS-1500	Sync Phase Inverter Cathode
R59	12KΩ	2	RC-123-8	BTB-12K	Sync Phase Inverter Plate
R60	2200Ω	½	RC-222-2	BTS-2200	Sync Phase Inverter Plate
R61	100KΩ	½	RC-104-2	BTS-100K	Voltage Divider
R62A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	⋆CRP-3	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R63	470KΩ	½	RC-474-2	BTS-470K	Vert. Osc. Grid
R64	220KΩ	½	RC-224-2	BTS-220K	Vert. Osc. Plate
R65	100KΩ 5%	½	RC-104-3	BTS-100K 5%	Vert. Feedback
R66	100KΩ 5%	½	RC-104-3	BTS-100K 5%	Voltage Divider
R67	10KΩ	½		BTS-10K	Vert. Peaking - See Note 4
R68	2.2Meg 5%	½	RC-225-3	BTS-2.2Meg 5%	Vert. Output Grid
R69	750Ω	½	RC-751-2		Vert. Output Cathode
R70	27KΩ	½	RC-273-2	BTS-27K	Horiz. Phase Det. Diode Load
R71	100KΩ	½	RC-104-2	BTS-100K	Horiz. Phase Det. Diode Load
R72	100KΩ	½	RC-104-2	BTS-100K	Horiz. Phase Det. Diode Load
R73	4.7Meg	½	RC-475-2	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R74	18KΩ	2	RC-183-8	BTB-18K	Horiz. Feedback
R75	470KΩ	½	RC-474-2	BTS-470K	Horiz. AFC Filter
R76	470KΩ	½	RC-474-2	BTS-470K	Horiz. MV Plate
R77	2200Ω	½	RC-222-2	BTS-2200	Horiz. MV Cathode
R78	68KΩ	½	RC-683-2	BTS-68K	Horiz. MV Grid
R79	270KΩ	½	RC-274-2	BTS-470K	Horiz. MV Plate
R80	5600Ω	½	RC-562-2	BTS-5600	Horiz. Peaking
R81	18KΩ	1	RC-183-5	BTA-18K	Decoupling
R82	68Ω	½	RC-680-2		Parasitic Suppressor
R83	680KΩ	½	RC-684-2	BTS-680K	Horiz. Output Grid
R84	22Ω	½	RC-220-2	BW-½ 22	Horiz. Output Cathode
R85	6200Ω	2	RC-622-8		Horiz. Output Screen
R86	3.3Ω	½	RC-33G-2		HV Rectifier Filament
R87	680KΩ	1	RC-684-5		HV Filter
R88	2200Ω	10	RW-222-17	1 3/4A-2250	Voltage Divider - Wire Wound
R89	470KΩ	½	RC-474-2	BTS-470K	Det. - Limiter Plate
R90	2000Ω	10	RW-202-17	1 3/4A-2000	Output Decoupling - Wire Wound
R91	150Ω 5%	½	RC-151-3	BTS-150 5%	Filament Dropping
R92	4.7Ω 5%	10	RW-47G-15		Surge Limiter - Wire Wound
R93	220KΩ	2	RC-224-8	BTB-220K	Line Isolation

Note 1. Some models use a 6800Ω resistor in this application.
Note 2. Some models use a 6200Ω resistor in this application.
Note 3. Some models use a 22KΩ resistor in this application.
Note 4. Some models use a 5600Ω or 8200Ω resistor in this application.
⋆ Items R62A, R62B, R62C, C63A, C63B, C63C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.
T1	117VAC	6.3VAC			T-122B	P-6466	P-2947	FO-63 ②	
	① .27A	② 3.8A			T-122A ①				

① Alternate transformer
② Drill one new mtg. hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: ARTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	REPLACEMENT DATA: TRIAD PART No.	NOTES
T2	410Ω Tap ② 41Ω	23Ω Tap ② 12Ω 17.7Ω SEC. 2 60Ω	T-124-B T-124-A ③	A-8130	HVO-7			Horiz. Output Trans.
T3	720Ω	14Ω	T-116 T-116-A ① DY-12-M	A-8113 ②	A-9038	TSO-2 ③	A-99X	Vert. Output Trans.
T4A	22Ω		DY-9	MDF-70	TY-3	Y-17		Horiz. Deflection Coils
B	52Ω							Vert. Deflection Coils

② Drill one new mtg. hole.
③ Alternate horiz. output trans.
④ Alternate vert. output trans.

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ARTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T5	4.3Ω	3.5Ω	295Ω	.65Ω	T-123	A-3877	A-2930	RO-302	S-3X	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ARTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.200A	66Ω	2 Hy.	LC-9	C-2325	C-2996	TR-1733 ②	C-17X

② Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ARTONE PART No.	MILLER PART No.	MEISSNER PART No.	
L2	Ant. Trans.	0Ω	0Ω	TLA-4			
L3	Ant. Coils	0Ω		TRW-1			
L4	RF Choke	0Ω					Part of C12
L5	RF Coils	0Ω		TRW-1			
L6	Mixer Grid Coils	0Ω		TRW-1			
L7	Osc. Coils	0Ω		TOW-1			
L8	1st. Video IF	.4Ω		TLP-1			
L9	Fil. Choke	0Ω		LC-10			
L10	RF Choke	3Ω		LC-19			
L11	Fil. Choke	0Ω		LC-1			
L12	2nd. Video IF	.1Ω		LV-6	6171 *	19-1020	
L13	Fil. Choke	0Ω		LC-1			
L14	3rd. Video IF	.2Ω	.2Ω	LV-7		17-1063	
L15	4th. Video IF	.4Ω	.4Ω	LV-8		17-1064	
L16	Series Peaking Coil	8.4Ω		LP-11	6180■	19-3180	Wound on 10KΩ resistor - orange dot
L17	Shunt Peaking Coil	13.5Ω		LP-10			Purple dot
L18	Sound Take-off Coil	2.9Ω	2.9Ω	LTO-3	6203	17-1021 †	
L19	Series Peaking Coil	8Ω		LP-13			Wound on 12KΩ resistor- white dot
L20	Shunt Peaking Coil	10Ω		LP-12-A	4566	19-1923	Green & black dot-450 microhenries
L21	4.5MC Sound IF	1.9Ω		LIF-11	1470A ▲	17-1031	
L22	4.5MC Quadrature Coil	22Ω		LIF-8-C	1470A▲	17-1031	
L23	Horiz. Osc. Coil	50Ω		LHO-2-E	6210	19-1576	14.4 Microhenries - 60 Microhenries
L24	Width Coil	28Ω	28Ω	L-M77J4-3			
L25	Horiz. Lin.	27Ω		L-M77J4			

* Enlarge mounting hole.
■ Parallel with 10KΩ resistor
† Drill mounting holes.
▲ Add capacitor externally.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARTONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4"X 6"	PM	3.2Ω		46J6	46A07	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	ARTONE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.255A	SR-300		6Q4	1090A	6S300	300
M2	.255A	SR-300		6Q4	1090A	6S300	300

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3 AG Slo-Blo Pigtail	1½ A. 125 V.	FE-4		31501.5		MDV 1½	
M4	3 AG Pigtail	½ A. 250 V.	FE-5		318.500		GJV ½	

MISCELLANEOUS

ITEM No.	PART NAME	ARTONE PART No.	NOTES
M5	RF Tuning	TT-7	
M6	Crystal	1N64	1N64
M7A	Focus Magnet	LF-7	
B	Focus Magnet	LF-8	
M8A	Ion Trap	1T-1A	
B	Ion Trap	1T-5	
B2	Trimmer	CT-6	Horiz. Drive (28-280MMF) or (40-300MMF)

COLLARO MODELS RC.521, RC.522, 3RC.521, 3RC.522

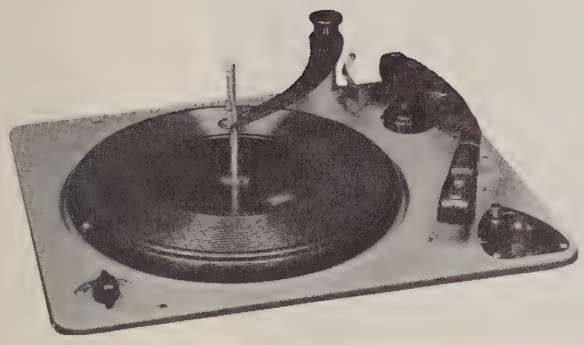


Figure 1. Model 3RC.522

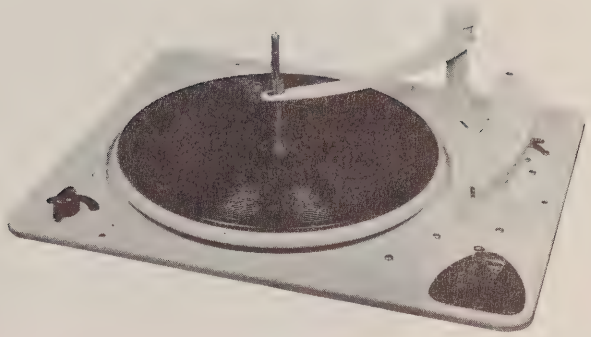


Figure 2. Model 3RC.521

COLLARO MODELS RC.521, RC.522, 3RC.521, 3RC.522

GENERAL INFORMATION

The Collaro Record Changer Models RC.521, RC.522, 3RC.521 and 3RC.522 are fundamentally identical in construction. In the case of the 3-speed models, provision is made to play 7" records as well as 10" and 12" records, while the intermixing models incorporate the addition of a trip lever which gives automatic pickup positioning for 10" and 12" records, allowing them to be mixed in any order. Other variations are as follows:

Model RC.521 - a non-intermixing changer for single-speed operation (i.e., 78 RPM).

Model 3RC.521 - a 3-speed version of Model RC.521 (i.e., 33-1/3, 45 and 78 RPM).

Model RC.522 - an intermixing changer for single-speed operation (i.e., 78 RPM).

Model 3RC.522 - a 3-speed version of Model RC.522 (i.e., 33-1/3, 45 and 78 RPM).

Connect these changers only to an outlet supplying 60 cycle, 115 volt, AC supply.

Manufactured by:

Collaro Limited
Ripple Works, By-Pass Road
Barking, Essex

Distributed in U. S. by:

Rockbar Corporation
211 E. 37th St.,
New York 16, N. Y.

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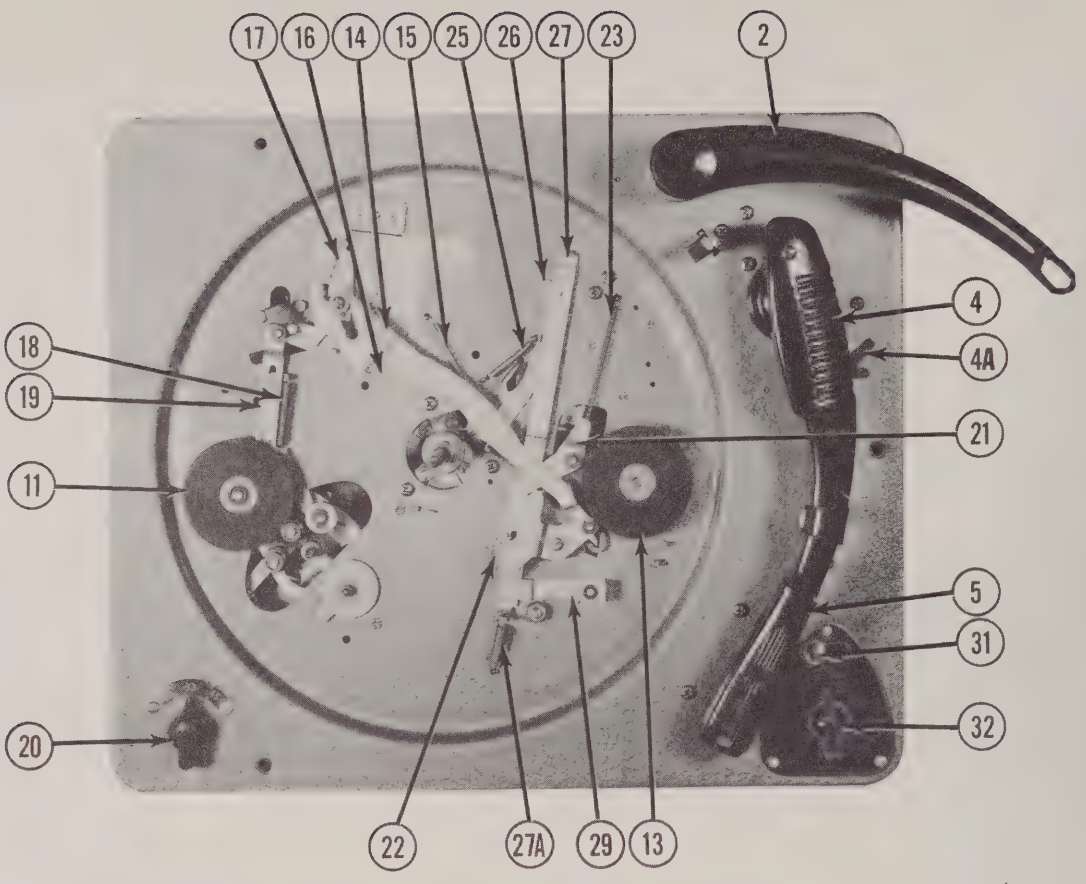

Figure 3.

PICKUPS

These changers are fitted with pickup arms designed to take Collaro plug-in Pickup Heads. The following information indicates the types available and also the purposes for which they are suitable.

Magnetic (Green spot only) -

Suitable for reproduction of 78 RPM records only. Any reputable make of standard steel needle of the semi-permanent type may be employed. Not suitable for use with Sapphire stylus.

High Fidelity (Lightweight magnetic) -

(With either high or low impedance windings. A matching transformer is supplied with low impedance windings.)

Green spot-for reproduction of 78 RPM records. Available with permanent sapphire stylus, or alternatively interchangeable needles, either steel or jewel tipped, may be employed.

Red spot - for reproduction of 33-1/3 and 45 RPM records. Available with permanent sapphire stylus only.

Crystal (High-fidelity)-

Green spot-for reproduction of 78 RPM records. Available with permanent sapphire stylus only.

Red spot - for reproduction of 33-1/3 and 45 RPM records. Available with permanent sapphire stylus only.

OPERATING INSTRUCTIONS

Capacity -

The Collaro will play up to nine records of the types listed opposite each Model. In the case of Models RC.522 and 3RC.522 10" and 12" records may be played intermixed. 7" records cannot be intermixed with other sizes. In all cases (except Model RC.522, in which positioning is entirely automatic) a position control knob is provided and must be preset to the particular position equivalent to the size of the record to be played. In 3-speed Models 3RC.521 and 3RC.522 the speed control knob must also be preset to give an appropriate turntable speed.

To Load -

To load records, the balancing arm (2) is lifted out of engagement with spindle (1) and then swung to the right until it is clear of the turntable. Records, up to a maximum of nine in number, and of types within the defined capacity of the particular model, are then placed on the top of the spindle in the order in which they are to be played. The slot in the record balancing arm should then be engaged with the spindle, and the arm allowed to rest on top of the stack of records. Do not attempt to intermix 33-1/3, 45 or 78 RPM records by operating speed change knob (20) while the changer is running.

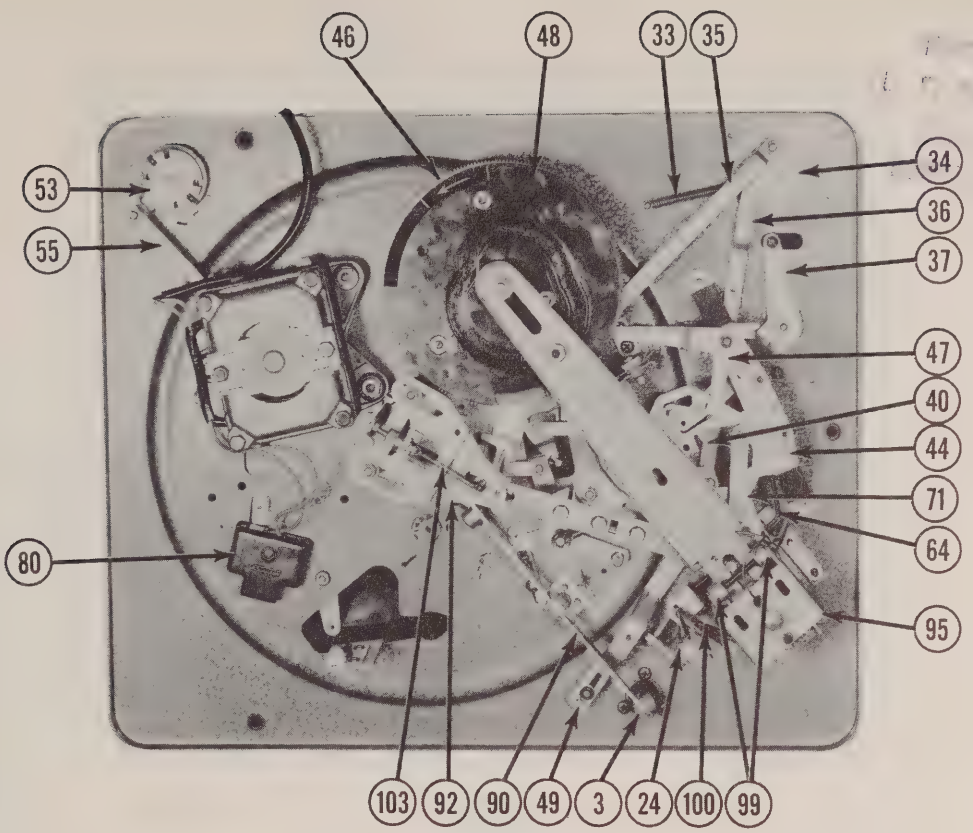

Figure 4. Underside of Model 3RC.522. Note position of motor mounting, which is common to both 3-speed Models 3RC.522 and 3RC.521. The unoccupied opening in the baseplate towards the lower left of the picture is utilized to house the motor and pulleys in the case of single-speed models only.

To Start -

To start the machine, after checking that position and speed controls are correctly set, the control knob on the right of the unit is turned fully to the left, held momentarily, and then released. After playing the last record, the pickup is automatically lifted from the record and the supply to the motor is switched off.

To Unload -

To unload records after they have been played, the balancing arm (2) is lifted out of engagement with the spindle, and swung to the right until clear of the records. The complete stack of records may then be lifted straight up and off the spindle.

Rejecting -

Any record may be rejected during playing by turning control knob (32) gently to the left. The pick-up arm will immediately lift from the record, and the next record will be released and commence to play.

Stopping -

The changer may be stopped at any time by turning control knob (32) fully to the right and releasing. The pickup arm will immediately lift from the record and swing to its outward position, when the supply to the motor will be automatically switched off.

SPECIAL FEATURES

Muting -

The pickup cartridge is muted during the change cycle, thus avoiding the reproduction of undesirable noises during the interval between records, and also avoiding the unpleasant "running down" effect due to slowing of the turntable when a record is rejected or when the "Stop" control is operated. The pickup cartridge, however, becomes "live" again when the machine switches off.

Retractable Drive -

Rubber tired pulleys (11 and 13) are automatically retracted when the unit is switched off. The development of flats on the tires, due to prolonged contact under pressure during periods of disuse, and consequential noisy running and unevenness of turntable speed are thus positively avoided.

CHANGE CYCLE

This changer is provided with what is known as a velocity trip mechanism. The change cycle is started by the faster inward motion of the pickup arm when the needle enters the lead-out groove at the end of a record.

The pickup arm assembly and the pickup tripping arm (62) are secured at opposite ends of the pick-

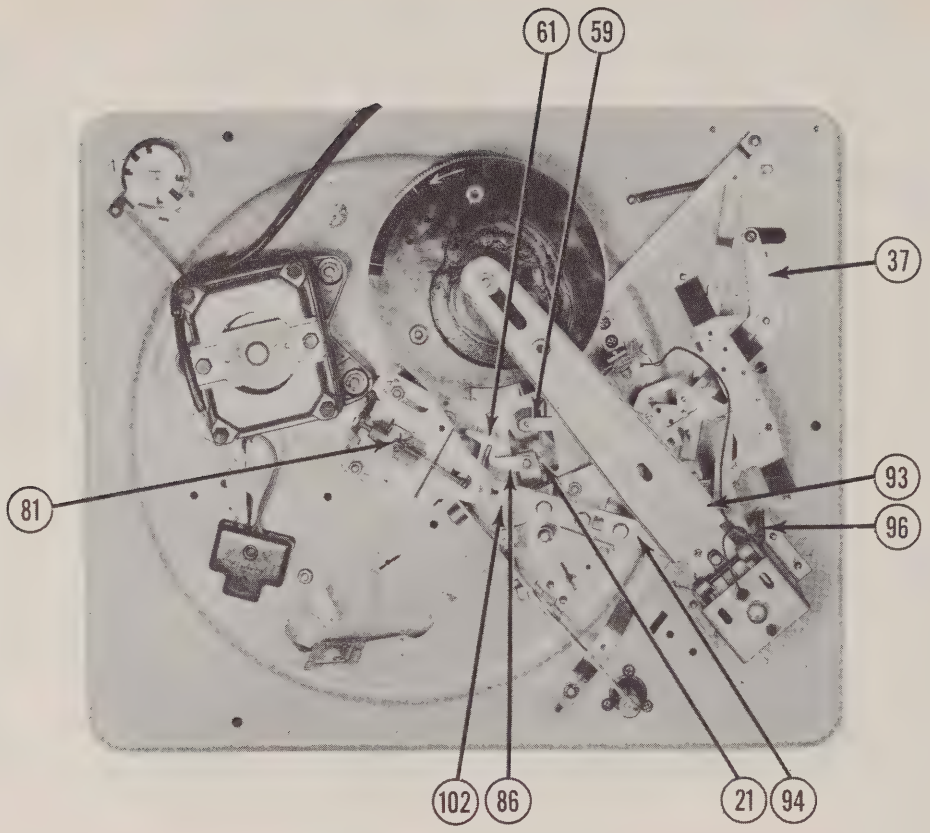

Figure 5. Underside of Model 3RC.521. Note the manually operated position control lever (37) which is incorporated in all models except RC.522 in which Pickup positioning is entirely automatic for 10" and 12" records only. Note also that items (24, 64 and 100) are not employed on this model or Model RC.521.

up arm shaft so that they move in unison. As the pickup arm nears the end of a record, the pickup tripping arm (62) pushes the push trip lever (61), which in turn, carries striker arm (86) in toward the turntable hub. Striker arm (86) is fed inwards by the friction provided by its own weight resting on the curved end of push trip lever (61).

While a record is playing, the small motions of striker arm (86) are not sufficient to trip the mechanism because, on each revolution of the turntable, the wiping action by the trip cam (point "A" on exploded view) moves striker arm (86) back far enough to clear the trip cam.

When the needle enters the lead-out groove, causing the pickup arm to advance rapidly toward the spindle, striker arm (86) is moved far enough to definitely engage the trip cam (point "A" on exploded view). As the trip cam engages with striker arm (86), the striker arm is pushed away from the turntable hub (toward the pickup arm) far enough to contact and push pin (point "B" on exploded view). This action releases swing bracket locking lever (21) from slide bar (27) which, in turn, allows swinging bracket (59) carrying cycle drive wheel (13) to move outward through action of spring (23). Since the turntable is rotating, the cycle drive wheel (13) also rotates, starting main cam (48) to revolve by action of the gear train associated with swinging bracket (59).

Simultaneously, the main slide (93) starts its forward travel and the cam surfaces (point "C" on exploded view) ride up on rollers (99) lifting the pickup arm clear of the record. The pickup arm actuating lever (87) is now pulled forward by main slide (93), swinging the pickup arm clear of the turntable.

At this time, the spindle actuating lever (102) moves towards the turntable hub (77) and contacts spindle slide (92), which in turn, is moved far enough to allow the record selector pawl (81) to ride down the incline on the spindle slide (point "D" on exploded view). The record selector pawl (81) now rises vertically until its upper end engages the center hole of the lower-most record in the stack and then moves sideways sufficiently to push the record off the spindle shelf.

During this sequence of operations the main slide (93) has reached its extreme forward travel and now starts moving toward the rear of the changer. As this takes place, the pickup arm actuating lever (87), which is connected to main slide (93), also moves towards the rear of the changer and by engaging with the pins in the pickup arm actuating plate (73) moves the pickup arm in over the record.

At this time, the stud (point "E" on exploded view) on the end of the pickup positioning arm (71) engages with one of the slotted tabs (40) on the pickup arm positioning plate thus stopping the inward travel of the pickup arm. The spring loaded rollers (99) now ride down the cam surface (point "C" on exploded view) lowering the pickup arm to the record.

As bakelite cam (48) nears the completion of its course, the innermost stud on the cam drive gear (46)

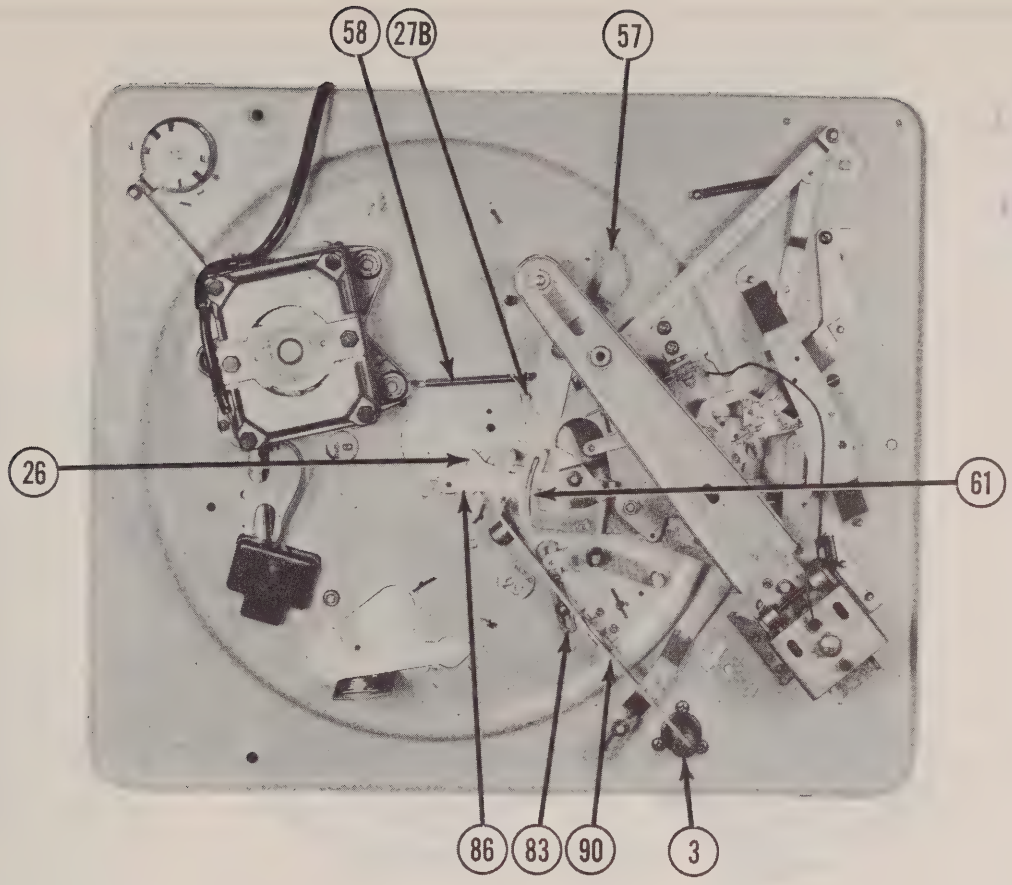

Figure 6. Underside of Model 3RC.521 with record dropping and spindle mechanism removed to reveal the automatic-trip mechanism.

rides against the cycle release cam (57), and in so doing, pivots the cycle release cam (57) far enough to release it from the lower middle stud on slide bar (27), thus allowing the slide bar to be pulled forward by action of spring (27A). Since the notch in the swing bracket locking lever (21) is engaged with the top stud on slide bar (27) the swing bracket locking lever (21) is also pulled forward pivoting swing bracket (59), which is associated with cycle drive wheel (13), away from the turntable rim. The change cycle is now completed and the pickup arm is free to ride across the record until the needle enters the eccentric tripping groove, at which time, the next change cycle will be started.

As soon as the last record has been dropped, the record balancing arm (2) drops below the shelf on spindle (1) and the balancing arm spindle (3) contacts shut-off lever (90). The balancing arm spindle (3), when in this position, lifts the lower forked end of shut-off lever (90) into contact with the underside of the baseplate. When the last record has finished playing, the change cycle starts again; however, this time, the automatic stop trip pawl (26) moves in behind the stud on shut-off link (16) and the notch in cycle release cam (57) is prevented from engaging with the lower middle stud on slide bar (27). As soon as the pickup arm has reached a position directly over the arm rest (7), the front lower stud on slide bar (27) clears the slide bar cam (46A) allowing slide bar (27) to return to its forward position by action of spring (27A). As slide bar (27) moves forward it carries the swing bracket locking lever (21) with it, which in turn, pivots the swinging bracket (59) and cycle drive wheel (13) away from the turntable rim, thus stopping the cycling mechanism.

Simultaneously, the automatic stop trip pawl (26) contacts shut-off link (16) and releases it from its notch in the baseplate. This permits idler wheel (11) to be disengaged from the turntable rim and for the motor power switch to be opened by action of spring (15), thus switching the machine off.

ADJUSTMENTS

Needle Set-Down -

IMPORTANT: The pick-up arm is located to the mechanism underneath the unit plate by means of a pair of spring-loaded rollers which engage in slots in the pick-up positioning arm (62). This is to prevent damage or strain to the mechanism should the pick-up arm be inadvertently moved sideways by hand, i.e., while changing the pick-up head or stylus, such movement causing the rollers to disengage from the slots. If left so displaced, the set-down position will be affected. It is, therefore, important to ensure that the rollers are located in the slots before determining whether adjustment of the set-down position is necessary. To do this, bring machine to switched-off position, move pickup arm inwards until its head touches spindle and then move outwards to position

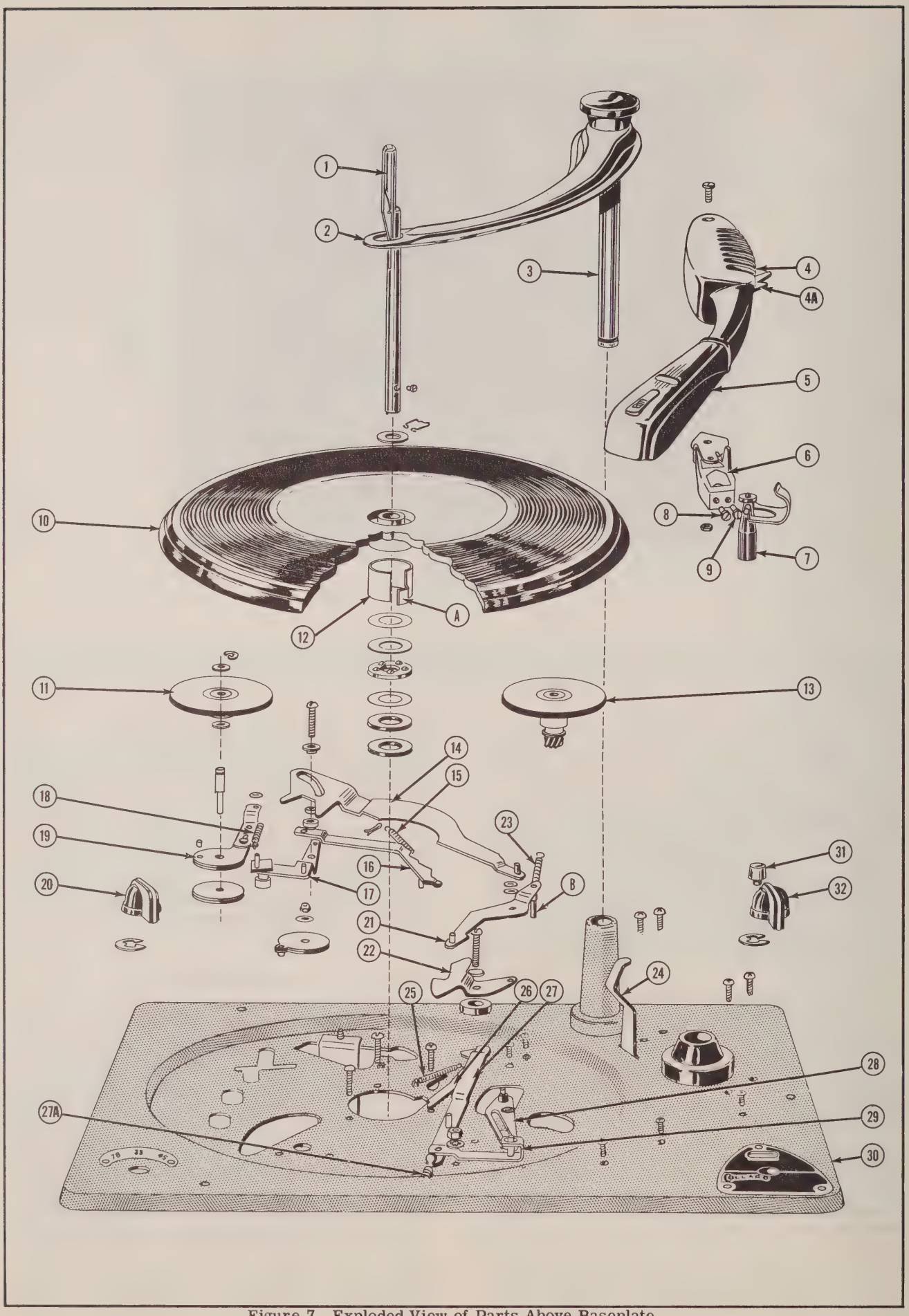

Figure 7. Exploded View of Parts Above Baseplate.

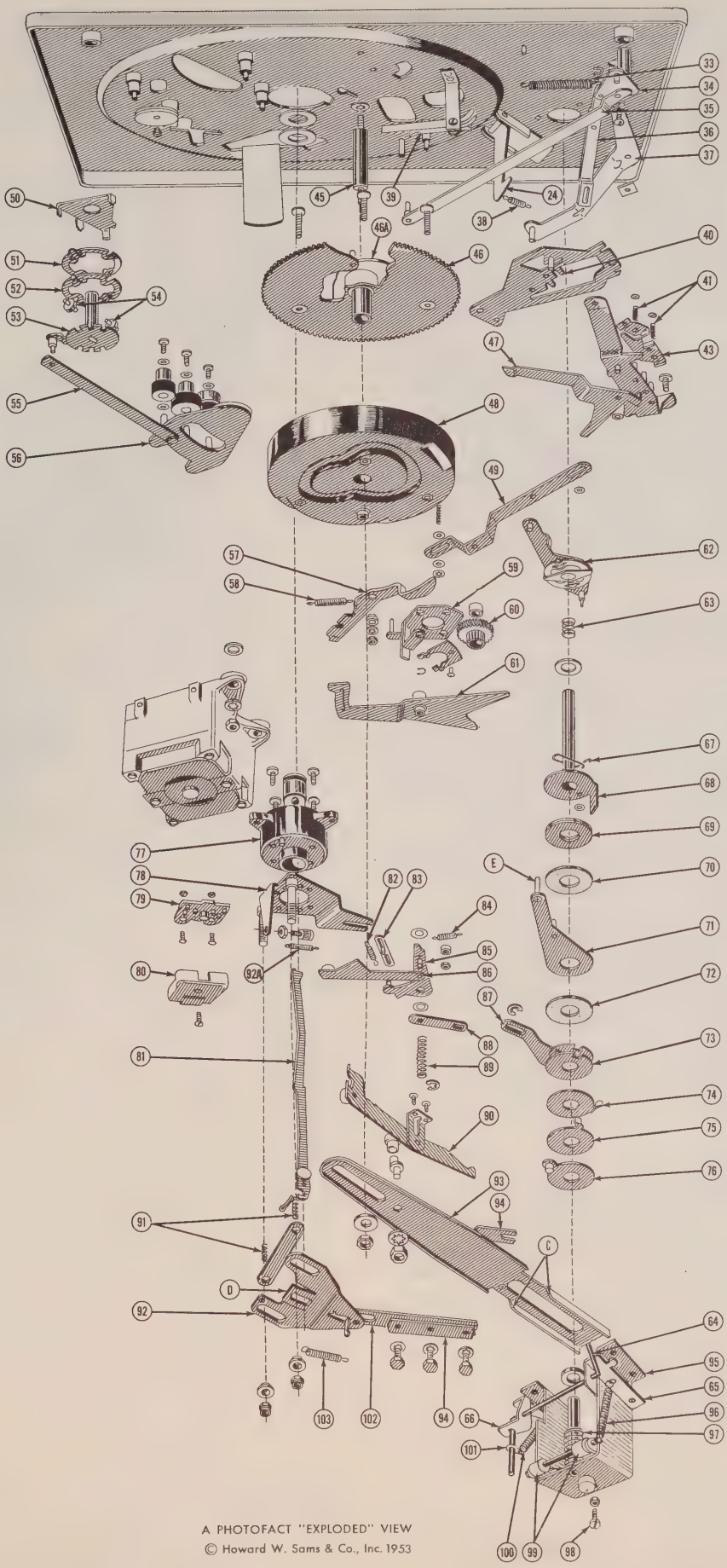

Figure 7A. Exploded View of Parts Below Baseplate.

over pickup arm rest (7). It will be distinctly felt when the rollers spring into position in their slots.

CAUTION: Attempting to operate the changer while the pickup arm is clamped to its rest may result in displacement of the pickup arm set-down position as described above.

The position at which the needle lands on the record may be adjusted by means of the two screws (8 and 9). To move needle set-down point inward, loosen screw (8) and tighten screw (9) the same amount. To move needle set-down point outward, loosen screw (9) and tighten screw (8) the same amount.

NOTE: This adjustment is very sensitive; turn the screws only about one-eighth of a turn at a time until the desired position is obtained, and finally make sure that both screws are really tight. This adjustment affects equally all positions (whether for 7", 10" or 12" records). Independent adjustment is provided for 10" and 12" records by means of slotted tabs in the positioning plate (40) which act as stops for these positions. By bending these tabs slightly inwards or outwards the needle set-down position will be correspondingly affected.

Readjusting Set-Down Position (i.e., after installing a new Pickup Arm) -

For 3-Speed Models 3RC.521 and 3RC.522.

1. Set position control lever (31) to 7" position.
2. Adjust by means of screws (8 and 9) to give correct needle set-down position.
3. Adjust slotted tabs on positioning plate (40), if necessary, to give correct 10" and 12" positions.

For Single-Speed Models RC.521 and RC.522.

1. Adjust by means of screws (8 and 9) to give correct needle set-down position when operating on 10" position.
2. Adjust appropriate slotted tab on positioning plate (40), if necessary, to give correct 12" position.

Pickup Arm Height Adjustment -

Minor adjustments may be made by means of screw (Figure 8). Turning this screw counterclockwise will increase the lift of the pickup arm and vice-versa. Correct adjustment is when the upper side of the pickup head clears the underside of a stack of records by 1/8" when the pickup arm is in its fully lifted position.

Major adjustments may be made as follows: (Refer to exploded view and Figure 8).

1. Allow the changer to complete a cycle and with the pickup arm resting on a record switch off the AC supply.
2. Adjust screw (A1) so that the underside of the pickup head (not the needle) comes level with the turntable covering.
3. Cycle changer to see if upper side of pickup head clears the underside of a stack of records by 1/8" when the pickup is in its fully lifted position. If not, loosen locknut and adjust screw (98). Retighten locknut securely and recheck all adjustments.

NOTE: Adjustment of screw (A1) affects equally both height to which pickup arm is lifted and the extreme depth to which it may fall. Adjustment of screw (98) affects height only. Hence it is essential to adjust screw (A1) correctly before adjusting screw (98).

Needle Pressure - (Refer to Figure 8) -

1. The Collaro is designed to track at as little as 3 grams, however, most present day cartridges are designed to track at from 5 to 12 grams. Before attempting to adjust the needle pressure refer to the cartridge manufactures specifications for the recommended needle pressure.
2. Set the weight compensating control (4A) in the "LP" position. Use a suitable gram scale and check the needle pressure at the point where the needle lands on a record. When the needle pressure is obtained for the "LP" position, the pressure for the "Std." position will also be correct.

The needle pressure may be adjusted, if necessary, as follows:

Loosen screw (A2), then turn adjustment screw (A3) clockwise to decrease needle pressure or counterclockwise to increase pressure. After adjustment is made tighten screw (A2).

TROUBLES

Record Dropping - (Refer to Figure 9) -

1. More than one record drops at a time.

(A) If more than one record drops at a time examine the center holes of your records. If these are badly worn their use should be avoided. Also make sure that the record retaining slide (A) drops perfectly freely under its own weight. If not, it is probable that some foreign matter has become lodged between the slide and the side of the groove in which it works. This may best be dislodged by means of a thin razor blade. Grease or oil on the slide may also be the cause of its failure to drop freely. In this connection, care should be taken if ever the turntable is removed, to see that grease or oil from the turntable bearing is not deposited on the slide. Carbon tetrachloride or other solvent applied with a small brush should be used to clean the parts if this cause of failure is suspected.

(B) Too great a projection of the record selector pawl (B) above step (C) may result in two records dropping at once (especially thin records of the long-playing variety): If the

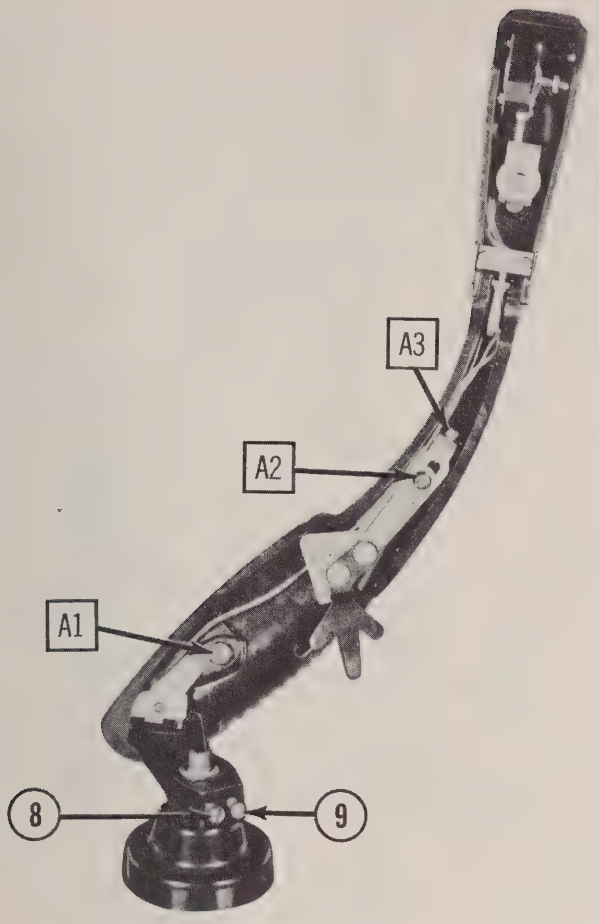

Figure 8

projection is excessively great it may result in records failing to drop by restricting the sideways movement of the record selector pawl.

2. If records fail to drop -

(A) Worn or chipped center holes can be the cause, but if failure in this respect occurs when using undamaged records, the action of record selector pawl (B) should be observed. This should first of all rise vertically until its upper end engages the center hole of the lower record in a stack and then move sideways enough to push the record off step (C). Failure of pawl (B) to rise vertically before starting its sideways movement will result in inconsistant dropping of records, and may be due to: Weakening or displacement of spring (103) or the lower end of the record selector pawl (81) binding in the slot through which it protrudes. The split pin (X) may be the cause of such binding if its ends are not spread open sufficiently to prevent partial rotation of the pin.

(B) Insufficient sideways movement of the record selector pawl (B) to push the record off step (C) could be due to: Excessive projection of pawl (B) above step (C) or the record selector pawl itself having been accidentally bent.

(C) Too small a projection of the record selector pawl (B) above step (C) may result in records failing to drop.

(D) Excessive engagement between stop (Y) and the lower end of record selector pawl (81) when at the extreme of its sideways movement can restrict the sideways movement of the upper-end of pawl (B) and result in records failing to drop.

(E) Make sure sliding plate (92) is returned freely and positively by action of spring (92A). Failure in this respect will result in inconsistent record dropping.

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ADJUSTMENT

The following procedure should be followed if the record dropping mechanism has been dismantled or its adjustment distrubed in any way:

1. Turn the bakelite cam (48) in the direction indicated by arrow in Figure 5 until record selector pawl (B) has started to move sideways.

2. Adjust the pair of self-locking nuts (Z) so that the upper edge of record selector pawl (B) projects a little less than 1/16" above the flat part of step (C). When making this adjustment be sure to adjust both nuts (Z) equally so as to keep the sliding plate (92) level. Also be sure to push record selector pawl (B) gently downwards before measuring its projection above step (C) so as to take up any free movement.

3. Loosen nut (W) and screw stop (Y) inwards until there is a definite gap between it and the lower end of record selector pawl (81) when the latter is pushed towards it as far as it will go. Turn bakelite cam (48) in direction of arrow (Figure 5) until the sliding bar (93) is at the extreme of its inward movement. With the cam still held in the same position, adjust stop (Y) until it barely touches the lower end of the record selector pawl (81), and lock with nut (W).

Changer Fails to Shut-Off After Last Record Has Been Played -

1. Balancing arm spindle (3) is not falling to its full extent and making contact with lever (90). This is due to the balancing arm spindle (3) sticking in its housing, and this should be freed by cleaning thoroughly. Remove the spindle if necessary by first removing the wire retaining ring at the bottom of the spindle. Use of oil is not recommended.

2. Lever (90) is not working freely up and down. The balancing arm spindle (3) should, when fully dropped, lift the lower forked end of lever (90) into contact with the underside of the unit plate, thus preventing the recess in trigger (57) from engaging

with pin (27B, Figure 6). This allows slide (27) to return under action of spring (27A), thus switching the machine off.

3. The auto-stop trip pawl (26) is not working freely under the action of its spring (25), which may have been accidentially stretched or displaced.

Changer Shuts-Off When Needle Lands on Last Record -

1. Check to see if the record balancing arm (2) has become bent upwards, thus allowing the balancing arm spindle (3) to fall into partial engagement with lever (90) while there is still one record resting on the spindle shelf. Loosening of the riveting holding the balancing arm (2) to it spindle (3) may have a similar effect.

(A) Correct operation will be obtained by setting the balancing arm (2) so the slotted end drops about 3/16" below the spindle shelf when the last record drops.

Changer Does not Cycle When Needle Reaches End of Record -

1. Check to see if self-locking nut (40A) is set so that the striker arm (86) rests in a horizontal position with its free end just clearing the bottom of the diecast housing (77) carrying the turntable bearing stud.

2. Make sure that striker arm (86) is pivoting quite freely, as it is only fed inwards by the friction provided by its own weight resting on the curved end of lever (61).

3. Check to see that swinging bracket (85) carrying drive pulley (13) is not restricted in its movement. This could be caused by damage or displacement of spring (23).

Operation of Reject Knob Fails to Bring Change Cycle Into Operation -

1. Check items described in paragraph 3 above.

Interruption of Change Cycle -

If the change cycle is interrupted between records (i. e., the turntable continues to revolve but the pickup arm remains stationary over its rest) it will be found that operation of the "Reject" knob will cause the cycle to be completed. The cause of this fault is as follows:

1. Failure of recess in trigger (57) to engage with pin (27B) Figure 6. This may be due to:

(A) Trigger (57) not working freely.

(B) Spring (58) may be weakened or displaced.

(C) Peg may be loose in slide bar (27) into which it is riveted.

Changer Continues to Cycle -

If the change mechanism cycles continuously without allowing each record to play to the end, the

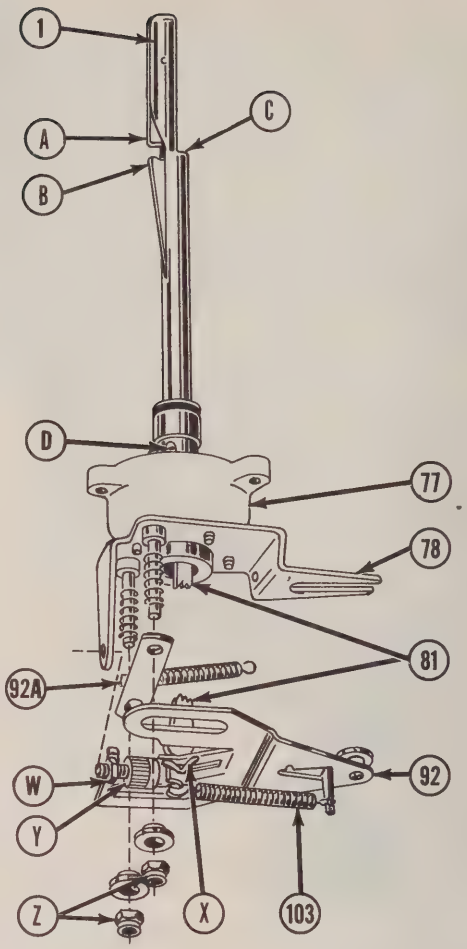

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Figure 9

cause may be associated with failure of the control knob (32) to return to its central position under the influence of its spring (33). This causes pin (21) to strike against the edge of trip cam (22) at the end of the change cycle, thus tripping the mechanism back into cycle again. To test whether this is the cause, turn the knob very slightly towards the "Stop" position immediately after switching on. If this cures the trouble. then check to see if stop link (36) is binding against the underside of the unit plate. If so, gently pry away with a screwdriver until perfectly free.

If this fault is only apparent after the mechanism goes into cycle at the end of a record, but not if a record is rejected, it is due to the auto-trip resetting lever (85) not being rotated fully during the change cycle by the action of spring (82) owing to weakening or displacement of the spring or undue stiffness of lever (85) on its pivot.

This fault may also be caused by the lower end of the peg to which spring (23) is attached having been accidentially bent towards the center of the changer. There should be a clearance of about 1/16" between the peg and the edge of the auto-trip resetting lever (85) when the turned-up end of the latter is set in contact with the end of the gap in the unit plate through which it protrudes.

PARTS LIST

Ref. No.	Part No.	Description
1	2764	Spindle Assembly
2		Record Balancing Arm
3	2818	Balancing Arm Spindle Assembly
4		Pickup Arm
4A		Weight Compensating Control
5		Plug-In Pickup Head
6		Pickup Arm Hinge Assembly
7	2562	Pickup Arm Rest
8		Set-Down Adjustment Screw
9		Set-Down Adjustment Screw
10	2974	Turntable
11	2798	Idler Wheel
12	2453	Trip Cam
13	2885	Cycle Drive Wheel
14	1366	Motor Actuating Lever
15	2526	Shut-Off Link Spring
16	2554	Shut-Off Link
17	2555	Switch Actuating Lever
18	2819	Spring
19	2557	Idler Wheel Cushion Link
20	2299	Speed Change Knob (Used only on 3 speed changers)
21	2556	Swing Bracket Locking Lever
22	2477	Trip Cam
23	2526	Locking Lever Spring
24	2550	12" Record Selector (Not used on all models)
25	2526	Automatic Stop Trip Pawl Spring
26	3273	Automatic Stop Trip Pawl
27	2328	Slide Bar
28	2470	Swing Bracket Delay Link
29	2553	Slide Bar Pivot Link
30		Baseplate
31	2365	Position Control Lever
32	2299	Start-Reject-Stop Control Knob
33	2574	Control Knob Return Spring
34	2506	Control Knob Shaft & Link Mounting Plate
35	2328	Manual Reject Lever
36	2448	Stop Link
37	2540	Set Down Position Lever
38	312	Spring
39		Muting Switch
40	2454	Pickup Arm Positioning Plate
41	1842	Spring
43	3097	Trip Cam
45	2001	Cam Mounting Axle
46	2942	Bakelite Cam Drive Gear (Non-Mixer)
	2943	Bakelite Cam Drive Gear (Mixer)
47	2492	Pickup Arm Positioning Plate Reset Lever
48	1989	Bakelite Cam
49	2349	Manual Stop Lever
50	2524	Speed Control Locking Bracket
51	2305	Speed Control Locking Plate
52	2305	Speed Control Locking Plate
53	2559	Speed Control Locking Cam
54	2373	Locking Rollers
55		Speed Change Link
56	2968	Motor Pulley Mounting Plate
57	2331	Cycle Release Cam
58	2600	Spring
59	2549	Swinging Bracket
60	2089	Pinion Gear
61	2544	Push Trip Lever
62	2542	Pickup Tripping Arm
63	2723	Compression Spring
64	2493	12" Selector Wire Lever
65	2523	Mounting Bracket for Item 64
66	2522	Mounting Bracket for Item 64
67	2594	Tension Spring
68	2543	Pickup Arm Shaft
69	2513	Felt-Metal Washer
70	2193	Felt Washer
71	2561	Pickup Positioning Arm
72	2193	Felt Washer
73	2926	Pickup Arm Actuating Plate
74	2197	Pickup Arm Shaft Engagement Washer
75	2893	Pickup Arm Actuating Plate Engagement Washer
76	2890	Main Slide Engagement Stud & Washer
77	2846	Turntable Hub
78	2833	Sliding Plate Mounting Bracket
79	1284	Switch Mounting Block
80	158	Switch Cover
81	2902	Record Selector Pawl
82	2575	Spring, Automatic Trip Resetting Lever
83	2446	Slide Bar Connecting Link
84	312	Spring
85	2545	Automatic Trip Resetting Lever
86	2546	Striker Arm
87	2927	Pickup Arm Actuating Lever
88	2585	Automatic Trip Resetting Lever Friction Link
89	2586	Compression Spring
90	2548	Shut-Off Lever
91		Compression Spring (2 used)
92	2800	Sliding Plate
93	2054	Main Slide
94	2929	Spindle Actuating Link
95	2964	Mounting Bracket for Pickup Arm Actuating Assembly
96	2838	Tension Spring
97	2599	Compression Spring
98	2278	Height Adjustment Screw
99	2835	Pickup Arm Lifting Rollers
100		12" Selector Lever Tension Spring
101		Spring Eyelet
102	2928	Spindle Actuating Lever
103	2146	Sliding Plate Tension Spring

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*TRADE MARK

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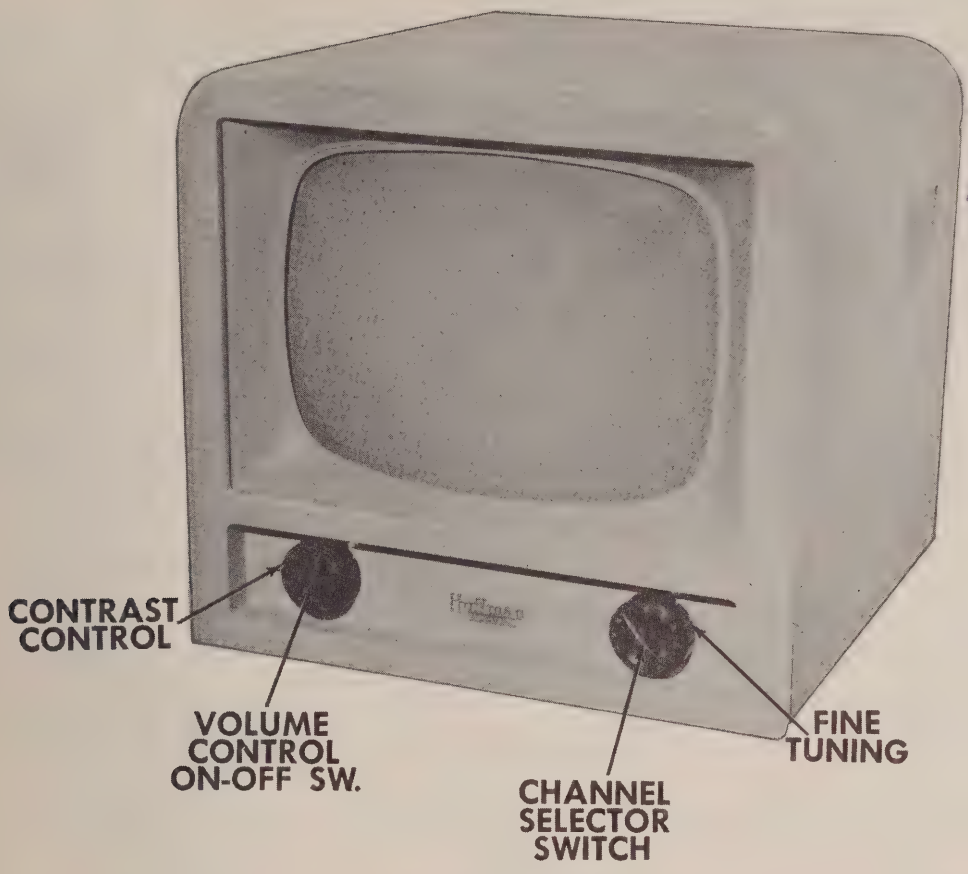

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HOFFMAN MODEL 7B110B

TRADE NAME	Hoffman Models 7B110B (Ch. 200, 210, M) 7B113 (Ch. 202) 7M109 (Ch. 200) 7M109B (210, M) 7M112 (Ch. 202), 7P111B (Ch. 210, M) 21M305 (Ch. 201).
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1.28 Amp. @117 volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Dissassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 14, 15, 16
Photographs
- Cabinet-Rear View 11
- Capacitor and Alignment Identification 4, 9
- Chassis-Top View 3
- RF Tuner 10
- Resistor and Inductor Identification 19, 20

Resistance Measurements 8
Servicing in the Field 18
Schematic (Alternate Tuner) 13
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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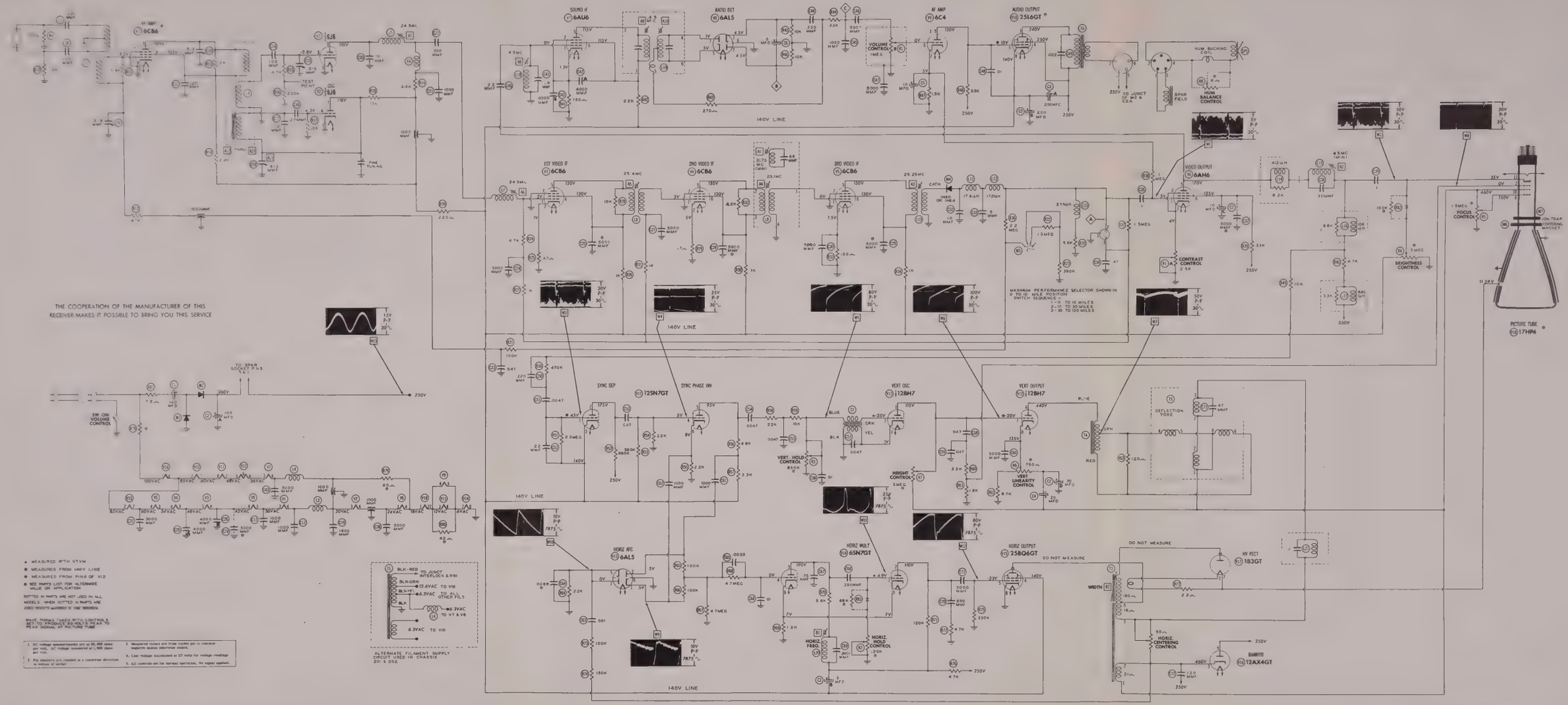
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TO JUNCT OF M2 & C8A
140V LINE
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 6AH6
CONTRAST CONTROL 2.5K
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
PICTURE TUBE V18 17HP4
MAXIMUM PERFORMANCE SELECTOR SHOWN IN 0 TO 10 MILE POSITION
SWITCH SEQUENCE
1 - 0 TO 10 MILES
2 - 10 TO 30 MILES
3 - 30 TO 100 MILES
RF AMP V1 6CB6
OSC V2 6J6
MIXER V2 6J6
TEST POINT
FINE TUNING
TO SPKR SOCKET PINS 7 & 1
SW ON VOLUME CONTROL
SYNC SEP
SYNC PHASE INV V11 12SN7GT
VERT OSC V12 12BH7
VERT OUTPUT V13 12BH7
VERT. HOLD CONTROL 850K
HEIGHT CONTROL 5MEG
VERT LINEARITY CONTROL
DEFLECTION YOKE
HORIZ AFC V14 6AL5
HORIZ MULT V15 6SN7GT
HORIZ OUTPUT V16 25BQ6GT
DO NOT MEASURE
HV RECT V17 1B3GT
WIDTH
HORIZ. CENTERING CONTROL
HORIZ. FREQ.
HORIZ. HOLD CONTROL
V19 12AX4GT
ALTERNATE FILAMENT SUPPLY CIRCUIT USED IN CHASSIS 201 & 202
BLK-RED TO JUNCT INTERLOCK & R81
BLK-GRN 12.6VAC TO V18
BLK-YEL 6.3VAC TO ALL OTHER FILS
BLK 3VAC TO V7 & V8
6.3VAC TO V10
▲ MEASURED WITH VTVM
■ MEASURED FROM 140V LINE
◆ MEASURED FROM PIN 9 OF V12
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS P-P PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin resistors are measured in a clockwise direction as bottom of socket
3. Measured values are from socket pin to chassis unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied.

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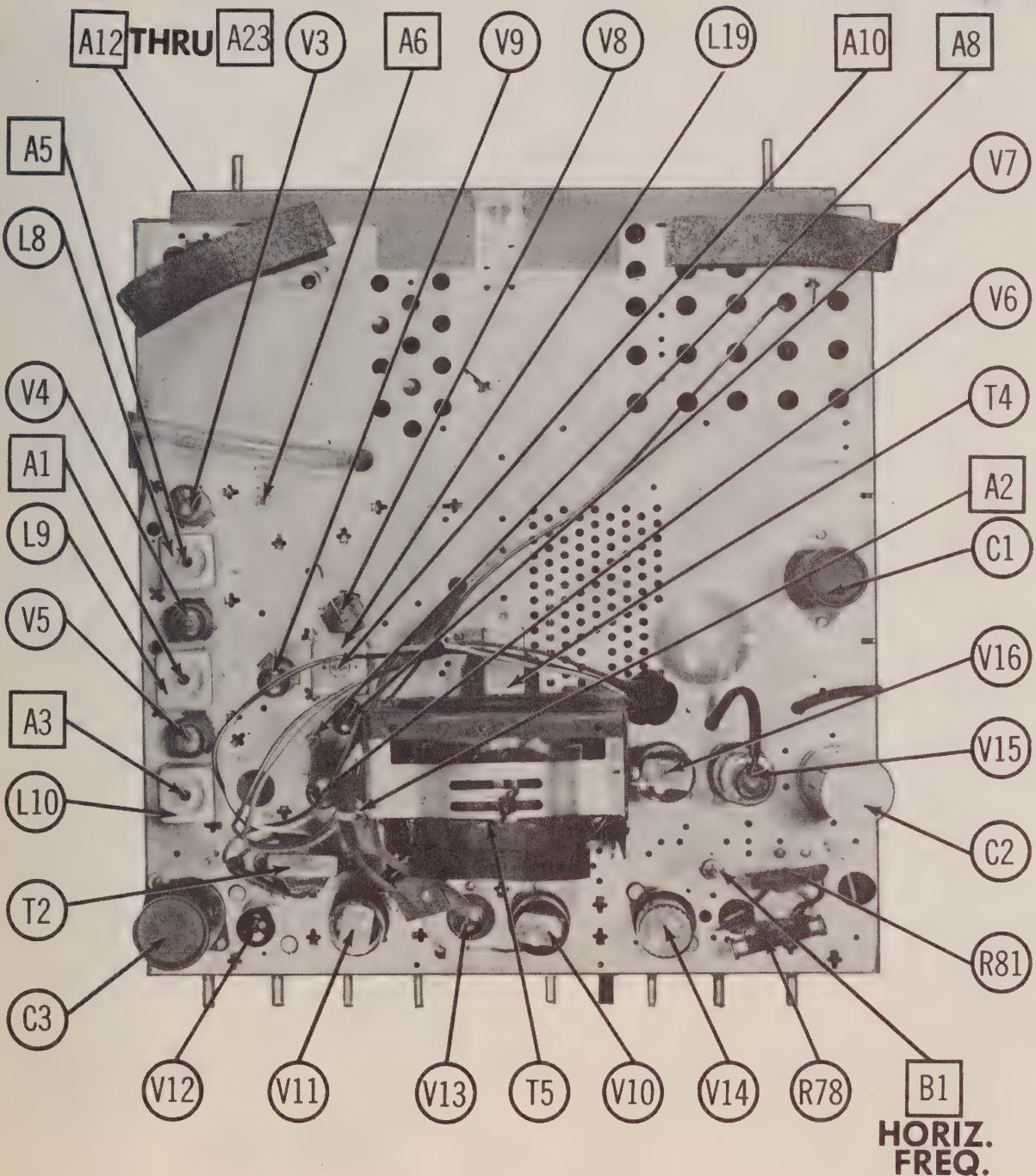
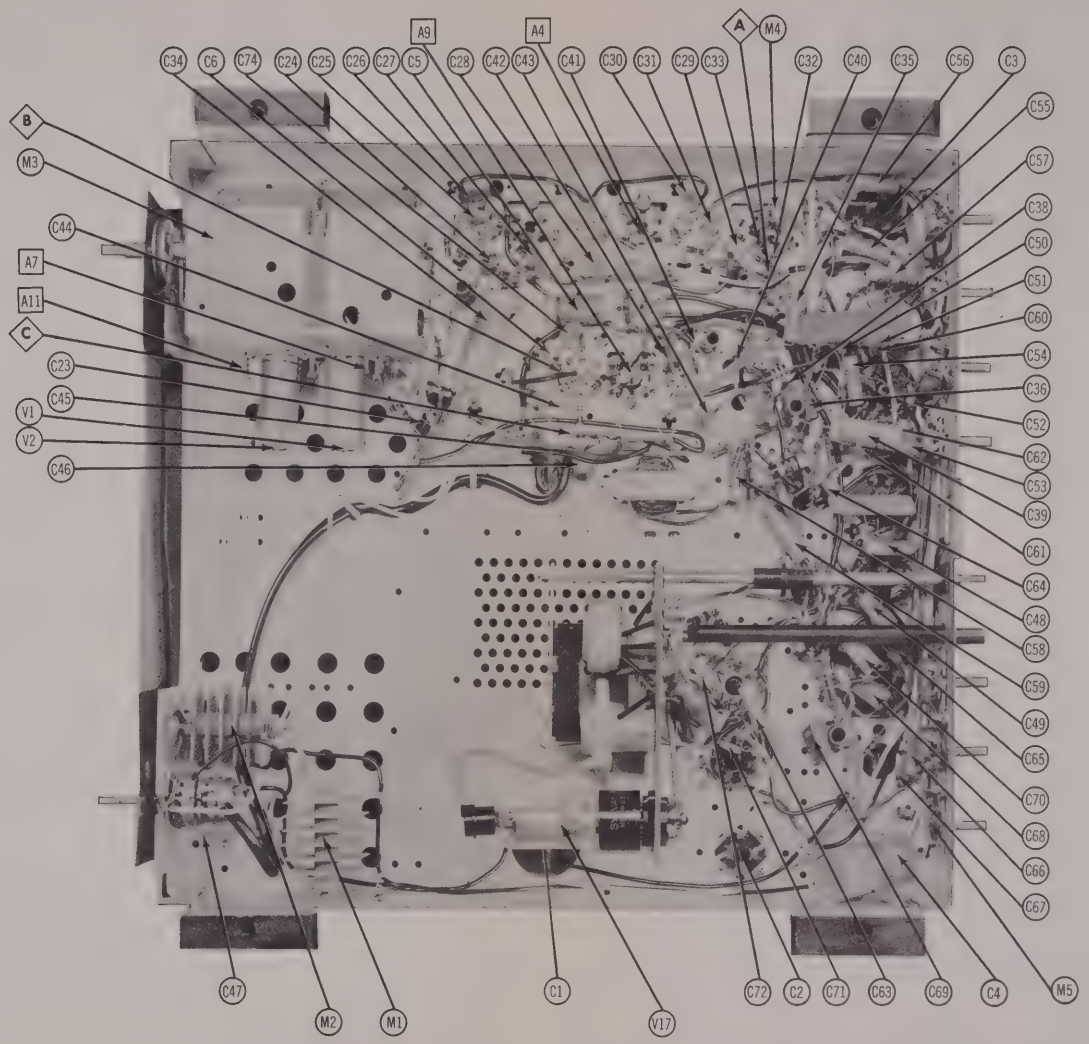
HOFFMAN MODELS 7B110B, 7B113, 7M109, 7M109B, 7M112, 7P111B, 21M305

HOFFMAN MODELS 7B110B, 7B113, 7M109, 7M109B, 7M112, 7P111B, 21M305

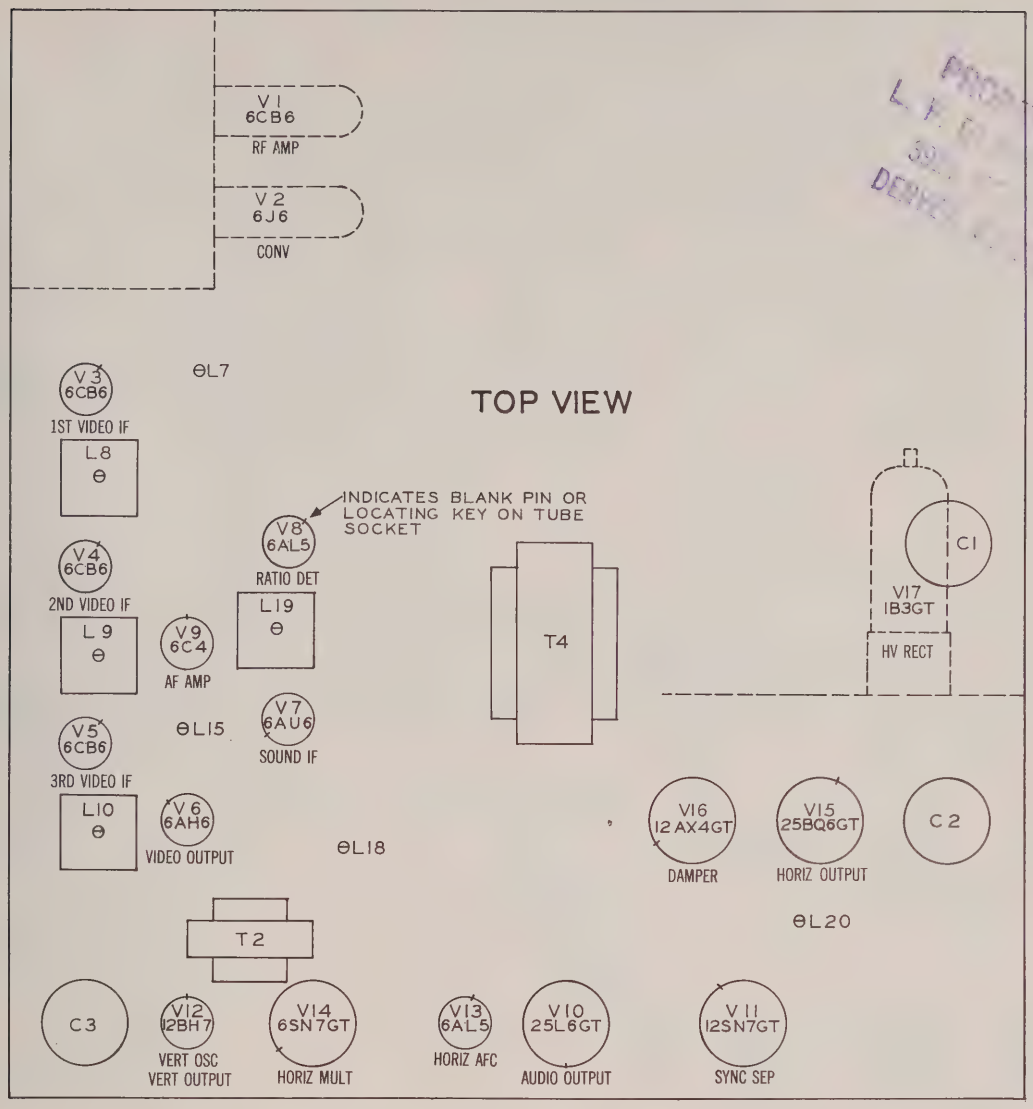


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



PROPERTY OF
L. F. G.
SHIP
DENVER, COLO.

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms.
Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V10
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V7, V8, V9, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V18
No vertical deflection - V12
Poor vert. linearity or foldover - V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, M1, M2
Vert. off freq. - V11, V12
Horiz. off freq. - V11, V13, V14

NOTE: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C34 (Pin 3 of the alignment jack on top of chassis.)
Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	21.75MC (Unmod.)	Any	DC probe thru 10KΩ to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	.005MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (Unmod.)	"	DC probe thru detector (Fig. 1) to pin 11 of picture tube.	A2	Adjust for MINIMUM deflection. Brightness control should be at normal or above normal setting.
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.25MC	"	DC probe thru 10KΩ to point (A). Common to chassis.	A3	Set contrast control for maximum contrast. Adjust for maximum deflection. Attenuate generator output to maintain 1 volt at VTVM.
4.	"	"	23.10MC	"	"	A4	"
5.	"	"	25.4MC	"	"	A5	"
6.	"	"	24.5MC	"	"	A6, A7	"

Repeat Video IF Alignment for most accurate results.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.75MC 23.25MC 25.25MC 26.25MC	Any	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 2 within limits as shown. A7 affects 26.25MC marker placement. A6 affects tilt if unable to obtain response through A6 and A7, adjust A3, A4 and A5.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 10KΩ to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe thru 10KΩ to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.005MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
9.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

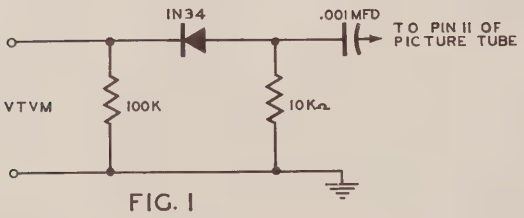
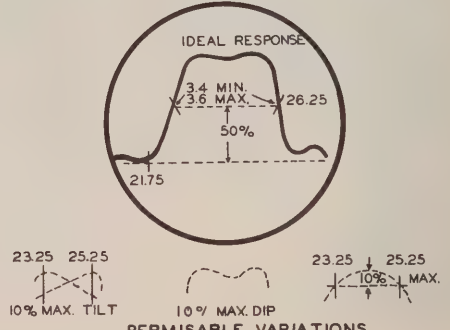


FIG. 1



PERMISABLE VARIATIONS
FIG.2

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under Video IF Alignment.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using All.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of All will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel adjustment screws are reached through a hole directly above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 213.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

THE RF AND MIXER PORTION OF THIS RECEIVER HAS BEEN CORRECTLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

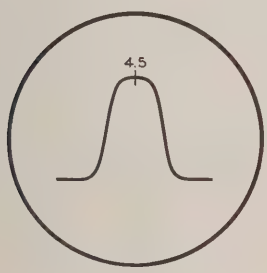


FIG. 3

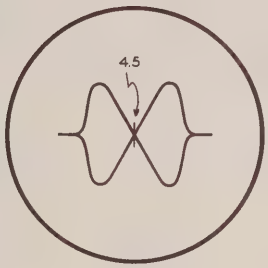


FIG. 4

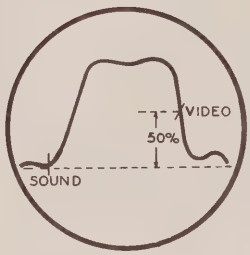
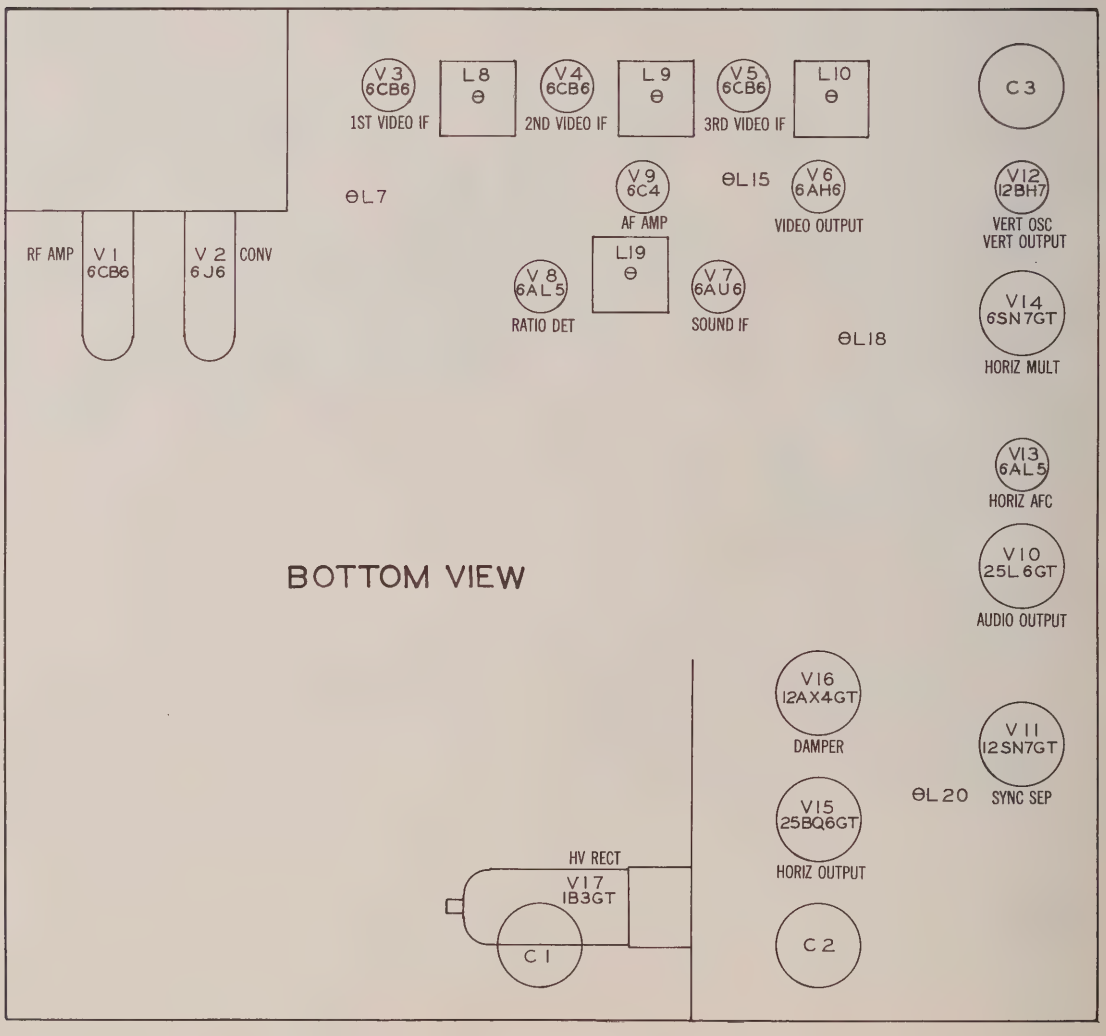


FIG. 5

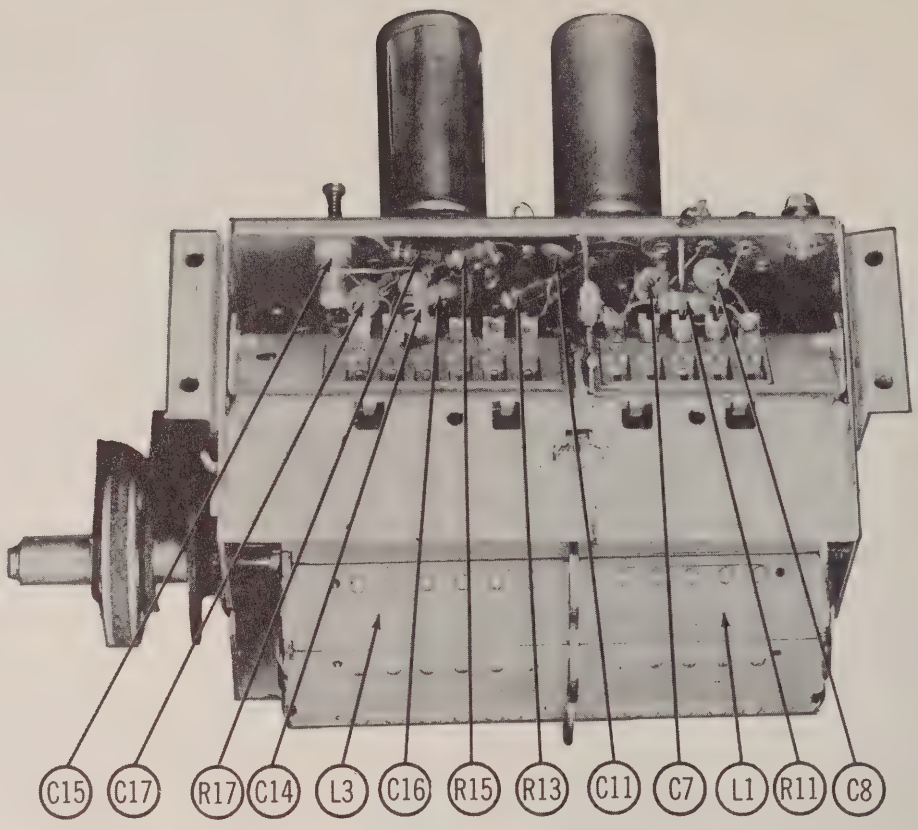
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2.3Meg	0Ω	10Ω	60Ω	¶2.5KΩ	¶2.5KΩ	0Ω		
V 2	6J6	¶10.3KΩ	¶4.2KΩ	8Ω	90Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	1.5Meg	47Ω	18Ω	16Ω	¶1KΩ	¶1KΩ	0Ω		
V 4	6CB6	1.5Meg	47Ω	18Ω	20Ω	¶1KΩ	¶1KΩ	0Ω		
V 5	6CB6	.2Ω	150Ω	20Ω	22Ω	¶1KΩ	¶1KΩ	0Ω		
V 6	6AH6	1 Meg	210Ω	9Ω	7Ω	†4.7KΩ	†33KΩ	210Ω		
V 7	6AU6	1 Ω	150Ω	14Ω	10Ω	¶2.2KΩ	¶22KΩ	150Ω		
V 8	6AL5	10KΩ	10KΩ	14Ω	16Ω	INF	0Ω	INF		
V 9	6C4	†33KΩ	INF	0Ω	.1Ω	†33KΩ	35Ω	1.5KΩ		
V 10	25L6GT	INF	24Ω	†270Ω	†57Ω	†33KΩ	4.9Meg	22Ω	140KΩ	
V 11	12SN7GT	2.2Meg	†680KΩ	140KΩ	22KΩ	†10KΩ	2.2KΩ	18Ω	22Ω	
V 12	12BH7GT	2.2Meg	500KΩ	3.5Ω	14Ω	18Ω /	▲800Ω	2.2Meg	9.2KΩ	16Ω
V 13	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	22KΩ	0Ω	22KΩ		
V 14	6SN7GT	65KΩ	†125KΩ	1.2KΩ	9.4Meg	†10KΩ	1.2KΩ	.1Ω	0Ω	
V 15	25BQ6GT	INF	24Ω	†125KΩ	¶0Ω	330KΩ	22KΩ	22Ω	0Ω	Top Cap ▲30Ω
V 16	12AX4GT	INF	▲21Ω	65KΩ	INF	82Ω	350KΩ	24Ω	24Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ▲210Ω
V 18	17HP4	12Ω	1.8KΩ	Pin 6 600Ω	Pin 10 62KΩ	Pin 11 275KΩ	Pin 12 6Ω			

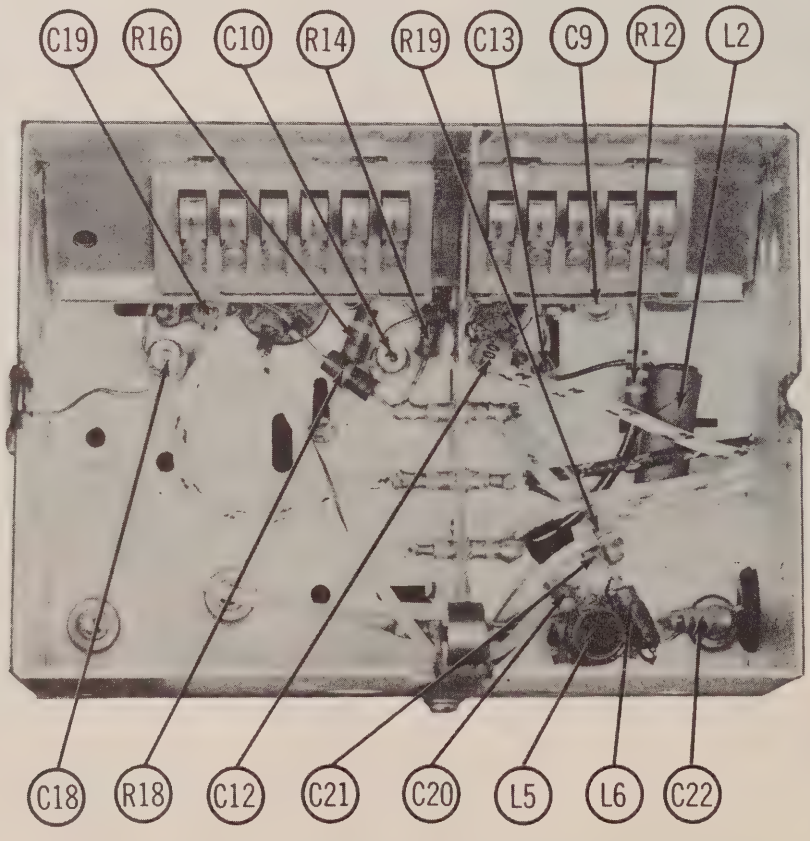
¶ MEASURED FROM 140 VOLT LINE
ALL MEASUREMENTS TAKEN WITH MAXIMUM PERFORMANCE SWITCH IN "0" TO 10 MILES POSITION
▲ MEASURED FROM PIN 3 of V16.
† MEASURED FROM OUTPUT OF M2.



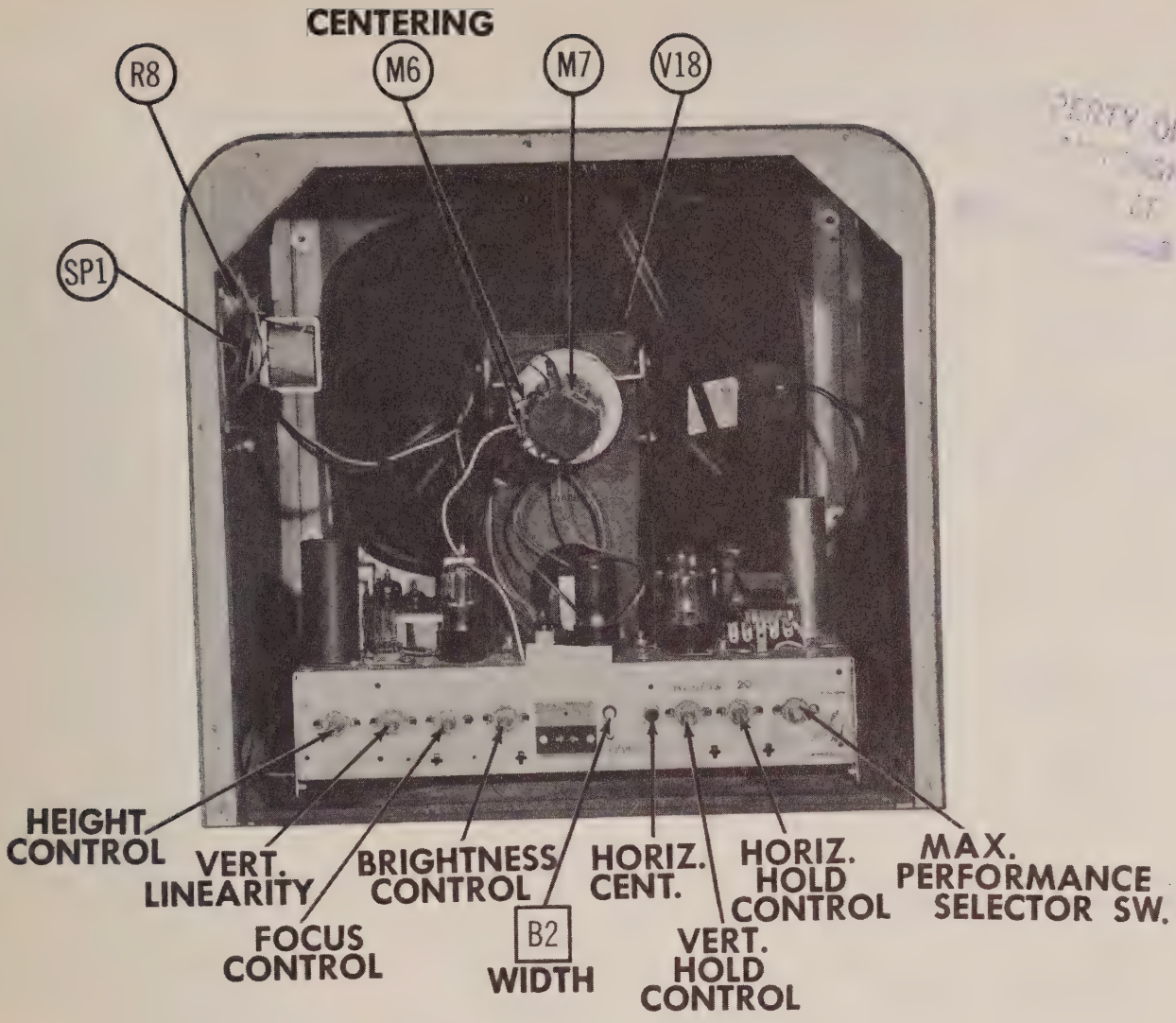
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range.

Turn the horizontal frequency slug (B1) counter clockwise while switching on and off channel until horizontal sync is lost. Turn B1 clockwise and note the number of diagonal bars present just before sync pull-in. If less than 2 bars are present abnormal operation of the horizontal section is indicated.

Continue turning B1 clockwise while switching on and off channel until horizontal sync is lost. Turn B1 counter clockwise until picture falls into sync, then turn an additional $\frac{1}{2}$ turn in same direction.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

CAUTION ! !

This set employes a voltage doubling circuit that has no line isolation. When servicing this set a line isolation transformer should be used to prevent dangerous electrical shock and possible damage to receiver and/or test equipment.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Substitute V16. Check yoke for open.

INSUFFICIENT SWEEP

Substutute V14, V15 and V16. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Substitute V10 and V11. Check T3, L21 and other components associated with Horizontal Output stage.	Check C71, C70 and other components associated with the Horizontal Oscillator stage.

DRIVE LINES

Substitute V16 and V15. Check L21 for open. Check C70 and other components associated with V15, and V16.

COMPRESSED AT LEFT SIDE

Substitute V16 and V15. Check T3 and other components associated with V16 and V15 .

FOLDS

Substitute V16 and V15. Check L21 for open. Check C70, C71 and other components of the Horizontal Sweep stages.

XMAS TREE EFFECT

Substitute V14. Check C69 and L20.

VERTICAL

LOSS OF SWEEP

Substitute V12. Check waveform at W6.

If Satisfactory	If Unsatisfactory
Check T4, yoke and other components associated with V12.	Check T2, C4, C57, C58 and C59. Check other components of the vertical oscillator.

INSUFFICIENT SWEEP

Substitute V12 . Check C20 and C60. Proceed as outlines under "Vertical Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V12. Check C4D, T4 and other components associated with V12.

FOLDS

Substitute V12. Check T4. Check vertical damping resistor , R63. Check yoke.

SYNC

HORIZONTAL

LOSS OF SYNC

Sutstitute V13 and V14. Check C61, C62, C63, C65 and C66. Check other components of the horizontal control circuit.

CRITICAL SYNC

Substitute V13 and V14. Proceed as outlined under "Horizontal, Loss of Sync."

PULLING PICTURE

Substitute V13 and V14. Check C65 and C66.

VERTICAL

LOSS OF SYNC

Substitute V12. Check C54, C55, C56, R58 and R59. Check T2.

CRITICAL SYNC

Substitute V12. Proceed as outlined under "Vertical, Loss of Sync."

TRIGGERING

Substitute V12 and V11. Inspect circuits of V11 and V12 for filament lead dress.

VIDEO

SOUND BARS

Check setting of 4.5MC traps, A2 and A8. Check setting of local oscillator.

POOR RESOLUTION

Substitute V1, V3, V4 and V5. Check alignment of video IF stages.

POOR CONTRAST

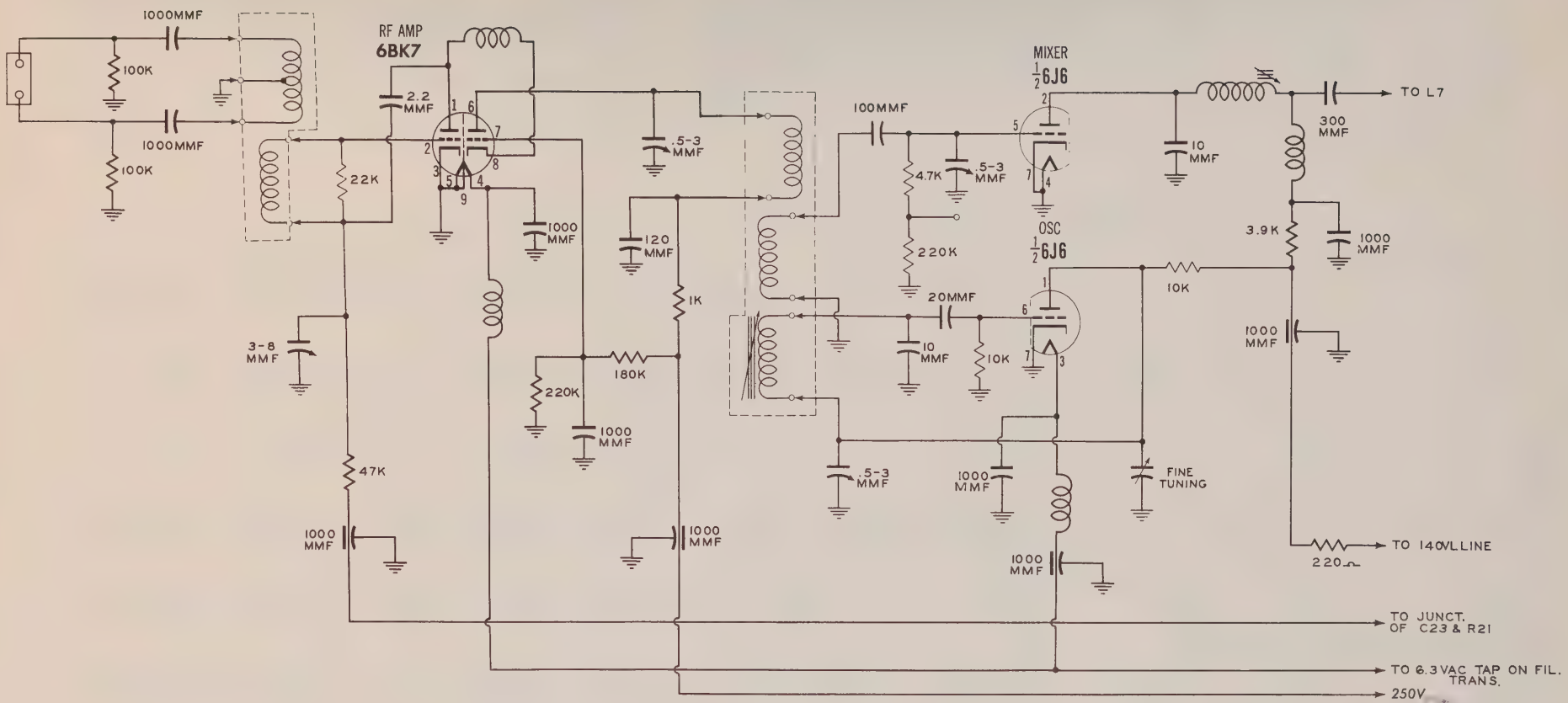
Substitute V6. Check components associated with V6. Check video detector crystal. Check picture tube.

SMEAR

Substitute V6. Check L14, L16 and L17 for open. Check R40 for change of value. Check C35 and C39 for leaky condition.

ONE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier tubes for heater to cathode leakage.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TUNER PART NO. 9741 USED IN MODELS NO 201 & 202 ONLY

ALTERNATE TUNER SCHEMATIC

HOFFMAN MODELS 7B110B, 7B113,
7M109, 7M109B, 7M112, 7P111B, 21M305

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	7CM	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AH6	6AH6	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier	6C4	6C4	6BG	
V10	Audio Output	25L6GT	25L6GT	7S	6W6GT used in Ch. 201, 202
V11	Sync Separator	12SN7GT	12SN7GT	8BD	6SN7GT used in Ch. 201, 202
V12	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V13	Horiz. AFC	6AL5	6AL5	6BT	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	25BQ6GT	25BQ6GT	6AM	6BQ6GT used in Ch. 201, 202
V16	Damper	12AX4GT	12AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RMA BASE TYPE	NOTES
V18A	17HP4	17HP4	12C	
B	17TP4		12C	
C	21FP4A	21FP4A	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	140	150	4245	AFHS1-70		XA004		FP1J7	R1267	
C2A	4100	300	4246	AFHS4-I25		D109		FP419.4	TVL-4581	
B	4200	150								
C	100	300								
D	30	150								
C3A	4200	150	4243	AFHS2-09		XB006		FP316.1	TVL-2444	
B	45	150				BR415				
C4	20	450	4233	PRS450/20		BR2045A		TC75	TVA-1709	
C5	10	50	4244	PRS50/10		BR105		TC32	TVA-1204	
C6	5	50	4209	PRS150/4		BR550		TC30	TVA-1303	
C7	1000			BPD-001	DD-102	TM5D1	801-001	DC-525	5HK-D1	
C8	1000			BPD-001	DD-102	TM5D1	801-001	DC-525	5HK-D1	
C9	3-8				829-3					
C10	.5-3				829-3		CT565A			
C11	120			BPD-00012	DD-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C12	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C14	100			SI100	DD-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C15	.5-3				829-3		CT565A			
C16	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C17	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C18	.5-3				829-3		CT565A			
C19	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C20	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	300			SI300	D6-301		GP2K-301	UC-533	5GA-T3	
C23	.047	200	4147	PS88-047	DF-503	PJ385		PT147	2TM-S47	
C24	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C26A	4000		4036	BPD-2X004	DD-2-502	TM5DD4	823-004	DCD-524	5HK-2D4	
B	4000									
C27	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C29	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C30	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C31	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	10		14036	SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C33	5		4093	SI5NP0	TCZ-4.7	5R5V5	NP0K-050	ZT-555	5TCC-V47	
C34	.47	200	4173	PS88-47		PJ3D5		PT405	2TM-P47	
C35	.1	200	4143	PS88-1	DF-104	PJ2P1		PT401	2TM-P1	
C36	30		4043		TCZ-30	5R5Q3	NP0J-300			
C37	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	Note 2
C38	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	.1	400	4150	PS88-1	DF-104	PT84P1		PT401	4TM-P1	
C40	2.2		4069		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C41	68		4046		TCZ-68		NP0-333-680		5TCC-Q68	
C42A	4000		4036	BPD-2X004	DD-2-502	TM5DD4	823-004	DCD-524	5HK-2D4	
B	4000									
C43	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	330		4065	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C45	1000		14031	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	.01	400	4142	PS88-01	D6-103	PTE4B1	GP2-333-103	PT411	4TM-S1	
C49	.022	600	4134	PS88-022	DD-203	PTE6D22		PT6122	6TM-S22	
C50	220		4084	SI220	TCZ-220		NP0-334-221		5TCC-T22	
C51	.0047	600	4127	PS88-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C52	22		14032							
C53	.047	400	4148	PS88-047	DF-503	PTE4S47		PT147	4TM-S47	
C54	.0047	400	4127	PS88-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C55	.0047	400	4127	PS88-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C56	.01	400	4142	PS88-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C57	.0047	400	4128	PS88-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C58	.047	400	4148	PS88-047	DF-503	PTE6S47		PT147	4TM-S47	
C59	.047	400	4148	PS88-047	DF-503	PTE6S47		PT1447	4TM-S47	
C60	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C61	1000		4025	SI1000	D6-102	TM5D1	GP3L-102	UC-531	5HK-D1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C62	1000		4025	SI1000	D6-102	TM5D1	GP3L-102	UC-531	5HK-D1	
C63	.001	1000	14134	PI088-001		PTE18D1		PT1821	MB-D1	
C64	.0068	600		P688-0068	D6-682	PTE5D68	GP2-333-682	TP445	6TM-D68	Note 3
C65	.0033	400	4182	P688-0033	D6-332	PTE5D33	GP2-333-332	PT6233	6TM-D3	
C66	.01	400	4142	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C67	75		14035							
C68	390	500	14033		1469-0004		5R5T4	MCB243	MB-34	
C69	3900	500	14035		1464-004		1DR5D4	MCB463	MB-24	
C70	680	500	14034							
C71	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C72	120	3000	14041						30GA-T12	
C73	47	2000							20GA-Q47	
C74	5000		4029	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	Note 2

Note 1. Some Models use 1000MMF in this application (part #1403).
Note 2. Not used in all Models.
Note 3. Some Models use .006MFD in this application (part #1416).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω	½	H-4873	QJ-448a	RTV-234		UP252L	Contrast-Panel
B	1 Meg	½					UR16A	Volume-Rear
C	Switch						U8-26	Attach to R1B
R2A	120KΩ with 50KΩ stop	½	H-4872	QJJ-125*	AG447-8*	AB-35 *	U-41*	Horiz. Hold-Note 1
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R2A
R3A	650KΩ with 350KΩ stop	½	H-4874	QJJ-133†	AG-58-5†	AB-59†	U-50†	Vert. Hold-Note 2
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R3A
R4A	5 Meg with 100KΩ stop	½	H-4877	QJJ-141††	AG-85-8††	AB-87††	U-87††	Brightness-Note 3
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R4A
R5A	1.5Meg	½	H-4871	QJJ-138	AG-83-8	AB-75	U-155	Focus-Note 4
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R5A
R6A	750Ω	½	H-4875	QJJ-105	AG-8 S	AB-5	U-4	Vert. Linearity-Note 5
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R6A
R7A	5 Meg with 1 Meg stop	½	H-4876	QJJ-141**	AG-85-8**	AB-87**	U-87**	Height-Note 6
B	Shaft		Not Req.	Not Req.	K88-3	AK-1	Not Req.	Attach to R7A
R8A	6Ω	1						Hum Bal. Wire Wound-Note7

Note 1. Chassis No. 201 & 202 use an alternate control (Part No. H-4886).
Note 2. Chassis No. 201 & 202 use an alternate control (Part No. H-4884).
Note 3. Chassis No. 201 & 202 use an alternate control (Part No. H-4889).
Note 4. Chassis No. 201 & 202 use an alternate control (Part No. H-4881).
Note 5. Chassis No. 201 & 202 use an alternate control (Part No. H-4885).
Note 6. Chassis No. 201 & 202 use an alternate control (Part No. H-4888).
Note 7. Not used in all models.
* Connect a 47KΩ resistor in series with the clockwise terminal.
† Connect a 330KΩ resistor in series with the clockwise terminal.
** Connect a 1 Meg resistor in series with the clockwise terminal.
†† Connect a 100KΩ resistor in series with the clockwise terminal & ground.
● UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UR3358).
▲ CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS Bll-112 & P1-106 (Panel), B13-137 & R2-124 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: HOFFMAN PART No.	IRC PART No.	NOTES
R9	100KΩ	1	4511	BTS-100K	
R10	100KΩ	½	4511	BTS-100K	
R11	3900Ω	½		BTS-3900	
R12	47KΩ	½			
R13	10KΩ	½			
R14	2200Ω	½		BTS-2200	
R15	4700Ω	½		BTS-4700	
R16	220KΩ	½			
R17	10KΩ	½			
R18	10KΩ	½			
R19	3900Ω	½			
R20	220Ω	½	4563	BTS-220	
R21	100KΩ	½	4571	BTS-100K	
R22	1.5Meg	½	4605	BTS-1.5Meg	
R23	390KΩ	½	4633	BTS-390K	
R24	4700Ω	½	4576	BTS-4700	
R25	47Ω	½	4639		
R26	1000Ω	½	4659	BTS-1000	
R27	1000Ω	½	4659	BTS-1000	
R28	30KΩ	½	4597	B	
R29	47Ω	½	4639		
R30	1000Ω	½	4659	BTS-1000	
R31	1000Ω	½	4659	BTS-1000	
R32	8200Ω	½	4651	BTS-8200	
R33	150Ω	½	4616	BTS-150	
R34	1000Ω	½	4659	BTS-1000	
R35	5600Ω	½	4629	BTS-5600	
R36	2.2Meg	½	4606	BTS-2.2Meg	
R37	1.5Meg	½	4605	BTS-1.5Meg	
R38	1Meg	½	4614	BTS-1Meg	
R39	33KΩ	1	24629	BTA-33K	
R40	4700Ω	2	24558	BTS-4700	
R41	150Ω	½	4616	BTS-150	
R42	2200Ω	½	4650	BTS-2200	
R43	270Ω	½	4663	BTS-270	
R44	33KΩ	½	4586	BTS-33K	
R45	10KΩ 5%	½	4624	BTS-10K 5%	
R46	10KΩ 5%	½	4624	BTS-10K 5%	
R47	150Ω	½	4630	BTS-150	
R48	33KΩ	½	4586	BTS-33K	
R49	10KΩ	½	4597	BTS-10K	
R50	470KΩ	½	4606	BTS-470K	
R51	2.2Meg	½	4606	BTS-2.2Meg	
R52	680KΩ	½	34568	BTS-680K	
R53	560KΩ	½	44590	BTA-560K	
R54	22KΩ	½	4628	BTS-22K	
R55	2200Ω	½	4650	BTS-2200	
R56	680Ω	½	4657	BTS-6800	
R57	3300Ω	½	4607	BTS-3300	
R58	22KΩ	½	4628	BTS-22K	
R59	10KΩ	½	4597	BTS-10K	
R60	3300Ω	½	4607	BTS-3300	
R61	1800Ω	½	4640	BTS-1800	
R62	87000Ω	½	4780	1 3/4A-9000	
R63	120Ω	½	4546	BTS-120	
R64	22KΩ	½	4628	BTS-22K	
R65	100KΩ	½	4571	BTS-100K	
R66	100KΩ	½	4571	BTS-100K	
R67	4.7Meg	½	4544	BTS-4.7Meg	
R68	4.7Meg	½	4544	BTS-4.7Meg	
R69	1200Ω	½	4553	BTS-1200	
R70	5600Ω	½	4629	BTS-5600	
R71	120KΩ	½	4548	BTS-120K	
R72	4700Ω	½	4578	BTS-4700	
R73	150KΩ	1	24698	BTA-150K	
R74	150KΩ	1	24698	BTA-150K	
R75	330KΩ	½	34531	BTS-330K	
R76	4700Ω	1	4570	BTA-4700	
R77	2.2Ω	½	4735		
R78	*	*	4878		Note 1
R79	80Ω	10	4759	1 3/4A-75	Note 1
R80	42Ω	3	4761	1 3/4A-40	Note 1
R81	7.5Ω	5	4762		
R82	100KΩ	½	4571	BTS-100K	Note 2
R83	68KΩ	½	4600	BTS-68K	Note 2

Note 1. Not used in Ch. 201 & 202.
Note 2. Used only in Ch. 201 & 202.
* Special resistor measures 193Ω hot and 200Ω cold.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	6.3VAC @ 3.6A tap ④ 12.6VAC @ .6A tap ⑤ 3.3VAC @ 6.8A	@ 1.2A		5034 *					

* Used in Ch. 201 and 202.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: HOFFMAN PART No	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	50Ω	220Ω	5162	A-8125	A-3003	TBO-5	A-97X	206T9 ⑧	Vert. Osc. Trans. Horiz. Output Trans.
T3	195Ω tap ⑦ 210Ω	21Ω SEC. 2 011	5165 ① 5168 ②						
T4	750Ω tap ⑥ 1Ω		5164	A-8140 ③	A-3081 ④	TSO-6 ③	A-103X ④		Vert. Output Trans.
T5A	31Ω		9747	DY-10	MDF-30	TY-4	Y-30		Horiz. Deflection Coils
B	3.5Ω		9753 ⑤						Vert. Deflection Coils

① Includes Horiz. Centering Control.
② Used in Models 21M305, 7M112, 7B113
③ Drill new mounting holes.
④ Drill one new mounting hole. " "
⑤ Used in Models 21M305, 7M112, 7B113
⑥ Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	2.1KΩ	3.3Ω	212Ω	.66Ω	5163	A-3825 ①	A-2928	RO-304	S-1X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP	REPLACEMENT DATA: HOFFMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4	57Ω	3.3Ω	9086		52A57B	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA: HOFFMAN PART No.	MILLER PART No	MEISSNER PART No	NOTES
L1A	Ant. Coil	0Ω CT	0Ω	5360			Channel 2
B	Ant. Coil	0Ω CT	0Ω	5361			Channel 3
C	Ant. Coil	0Ω CT	0Ω	5362			Channel 4
D	Ant. Coil	0Ω CT	0Ω	5363			Channel 5
E	Ant. Coil	0Ω CT	0Ω	5364			Channel 6
F	Ant. Coil	0Ω CT	0Ω	5365			Channel 7
G	Ant. Coil	0Ω CT	0Ω	5366			Channel 8
H	Ant. Coil	0Ω CT	0Ω	5367			Channel 9
I	Ant.Coil	0Ω CT	0Ω	5368			Channel 10
J	Ant. Coil	0Ω CT	0Ω	5369			Channel 11
K	Ant. Coil	0Ω CT	0Ω	5370			Channel 12
L	Ant. Coil	0Ω CT	0Ω	5371			Channel 13
L2	Fil. Choke	0Ω					
L2A	RF. Mixer Grid & Osc. Coil	0Ω		5348			Channel 2
B	RF. Mixer Grid & Osc. Coil	0Ω		5349			Channel 3
C	RF. Mixer Grid & Osc. Coil	0Ω		5350			Channel 4
D	RF. Mixer Grid & Osc. Coil	0Ω		5351			Channel 5
E	RF. Mixer Grid & Osc. Coil	0Ω		5352			Channel 6
F	RF. Mixer Grid & Osc. Coil	0Ω		5353			Channel 7
G	RF. Mixer Grid & Osc. Coil	0Ω		5354			Channel 8
H	RF. Mixer Grid & Osc. Coil	0Ω		5355			Channel 9
I	RF. Mixer Grid & Osc. Coil	0Ω		5356			Channel 10
J	RF. Mixer Grid & Osc. Coil	0Ω		5357			Channel 11
K	RF. Mixer Grid & Osc. Coil	0Ω		5358			Channel 12
L	RF. Mixer Grid & Osc. Coil	0Ω		5359			Channel 13

HOFFMAN MODELS 7B110B, 7B113, 7M109, 7M109B, 7M112, 7P111B, 21M305

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	HOFFMAN PART No.	MILLER PART No.	MEISSNER PART No.	
L4	Fil. Choke	0Ω		5161	4604	19-3001	1.3 Microhenries
L5	Conv. Plate	.4Ω					
L6	RF Choke	0Ω					
L7	1st. Video IF	.2Ω		5446	6171 *	19-1020	
L8	2nd. Video IF	.2Ω	.2Ω	5444			
L9	3rd. Video IF	.2Ω	.2Ω	5456			Includes trap
L10	4th. Video IF	.4Ω	.4Ω	5445			
L11	Series Peaking Coil	2.2Ω		5166	4624	19-3036	17.6 Microhenries
L12	Series Peaking Coil	6Ω		5448	6180	19-3180	172 Microhenries
L13	Shunt Peaking Coil	9.5Ω		5449		19-3300	335 Microhenries
L14	Series Peaking Coil	10.5Ω		5450	4648 †	19-4412	412 Microhenries, wound on 8.2KΩ resistor
L15	4.5MC Trap	2.4Ω		5453	1470	20-1004	
L16	Shunt Peaking Coil	4.8Ω		5451	6177 ■	19-4121	106 Microhenries, wound on 6.8KΩ resistor
L17	Shunt Peaking Coil	15Ω		5452		19-4840	840 Microhenries, wound on 3.3KΩ resistor
L18	Sound IF	1Ω		5454	1470	17-3400	
L19	Ratio Det.	4Ω	.6ΩCT	5443	1468	17-1033	Tertiary Winding -.4Ω
L20	Horiz. Osc.	46Ω		5447	6210	19-1576	
L21	Anti-ringing coil	12.5Ω		5455			Wound on .1MMF capacitor

* Enlarge mounting hole.
† Parallel with 8.2KΩ resistor
■ Parallel with 6.8KΩ resistor

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	HOFFMAN PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.200ADC	9735	NK5	6Q4	1090A	6S300	300
M2	.200ADC	9735	NK5	6Q4	1090A	6S300	300

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3A	RF Tuner	9750	Models 7M109, 7M109B, 7B110B, 7P111B
B	RF Tuner	9741	Models 7M112, 7B113, 21M305
M4	Crystal Diode	9075	Video Detector (1N60 or 1N64)
M5A	Switch	6032	Maximum performance selector, Models 7M109, 7M109B, 7B110B, 7P111B
B	Switch	6033	Maximum performance selector, Models 7M112, 7B113,21M305
M6	Centering Magnet	9722	
M7	Ion Trap	9702	
	Cabinet	7667	Model 7M109
	Cabinet	7691	Model 7M109B
	Cabinet	7692	Model 7B110B
	Cabinet	7693	Model 7P111B
	Safety Glass	772	
	Mask	3848	
	Bottom Cover	3850	Model 7M109
	Bottom Cover	3908	Models 7M109B, 7B110B, 7P111B
	Back Assembly	33573	Model 7M109
	Back Assembly	33586	Models 7M109B, 7B110B, 7P111B
	Knob	3856	Channel Selector, Model 7M109
	Knob	3866C	Channel Selector, Models 7M109B, 7B110B, 7P111B
	Knob	3858	Fine tuning, Model 7M109
	Knob	3867C	Fine Tuning, Models 7M109B, 7B110B, 7P111B
	Knob	3857	Off/On Volume, Model 7M109
	Knob	3864C	Off/On Volume, Models 7M109B, 7B110B, 7P111B
	Knob	3859	Contrast, Model 7M109
	Knob	3865C	Contrast, Models 7M109B, 7B110B, 7P111B
	Knob	3840	Maximum performance selector

TROUBLE SHOOTING AIDS (CONT.)

AUDIO

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO

WEAK OR NO SOUND

Substitute V7, V8, V9 and V10. Check asound IF and Ratio Detector alignment. Check components of the audio stages.

BUZZ

Check setting of Ratio Detector secondary A10. If buzz still present, substitute V8 and readjust A10.

DISTORTED

Substitute V7, V8, V9 and V10. Check circuits of V9 and V10 using audio signal generator. Check ratio detector and sound IF alignment. Check Video IF alignement.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Substitute V14, V15, V16 and V17. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check T3, R77 and other components associated with V15 and V16.	Check C71 and other components associated with V14.

WEAK HIGH VOLTAGE

Substitute V17, V16, V14 and V14. Proceed as outlined under "Loss of High Voltage."

BLOOMING

Substitute V17, V16, and V15. Check R77 for change of value. Check picture tube. picture tube.

POWER

SMALL AND/OR DIM RASTER

MEASURE B+

If Satisfactory	If Low
Check horizontal output and damper stages. Check picture tube.	Check B+ curcuits for shorts. Check selenium rectifiers. Check B+ filter capacitors.

DIM RASTER POOR SOUND

Check B+ circuits for shorts. Check selenium rectifiers. Check B+ filter capacitors.

GENERAL

RASTER NO SOUND NO PICTURE

Substitute V1, V2, V3, V4, V5 and V6. Check video detector crystal. Check components of the video IF strip.

WEAK PICTURE WEAK SOUND

Substitute V1, C2, V3, V4, V5 and V6. Check video detector crystal.

SOUND NO PICTURE

Check C39 and R4. Check picture tube.

INTERMITTANT STREAKS

Check high voltage network for corona discharge and arcing.

DEAD SET

Check R78, R81 for open. Check V16 and V14 for open filaments.

TOTAL LOSS OF SYNC

Substitute V11. Check associated circuit components.

POOR OR NO FUCUS

Check R5. Check voltage variation at pin 6 of picture tube. It should vary from zero to approximately 450V over the fully range of the focus control. Check picture tube.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may accomplished by removing the Channel Selector and Fine Tuning knobs.

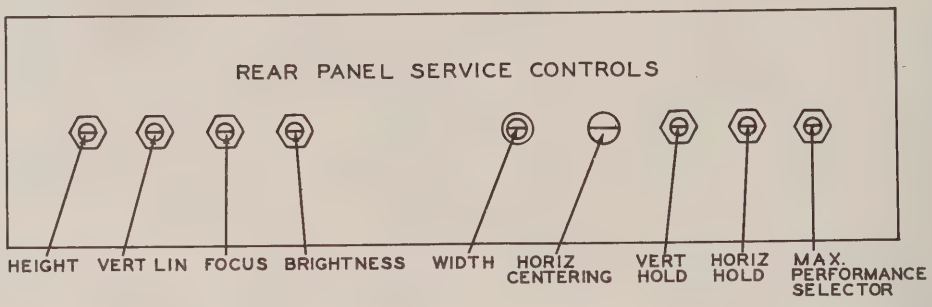
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Freq. slug L20 until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L19 located on top of chassis. (See tube placement chart)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Disconnect built-in antenna and transmission line.
3. Remove 7 wood screws. Remove rear cover.
4. Disconnect speaker. Remove 4 speaker nuts. Remove speaker. (Not necessary for chassis removal).
5. Remove 4 chassis bolts. Remove chassis.

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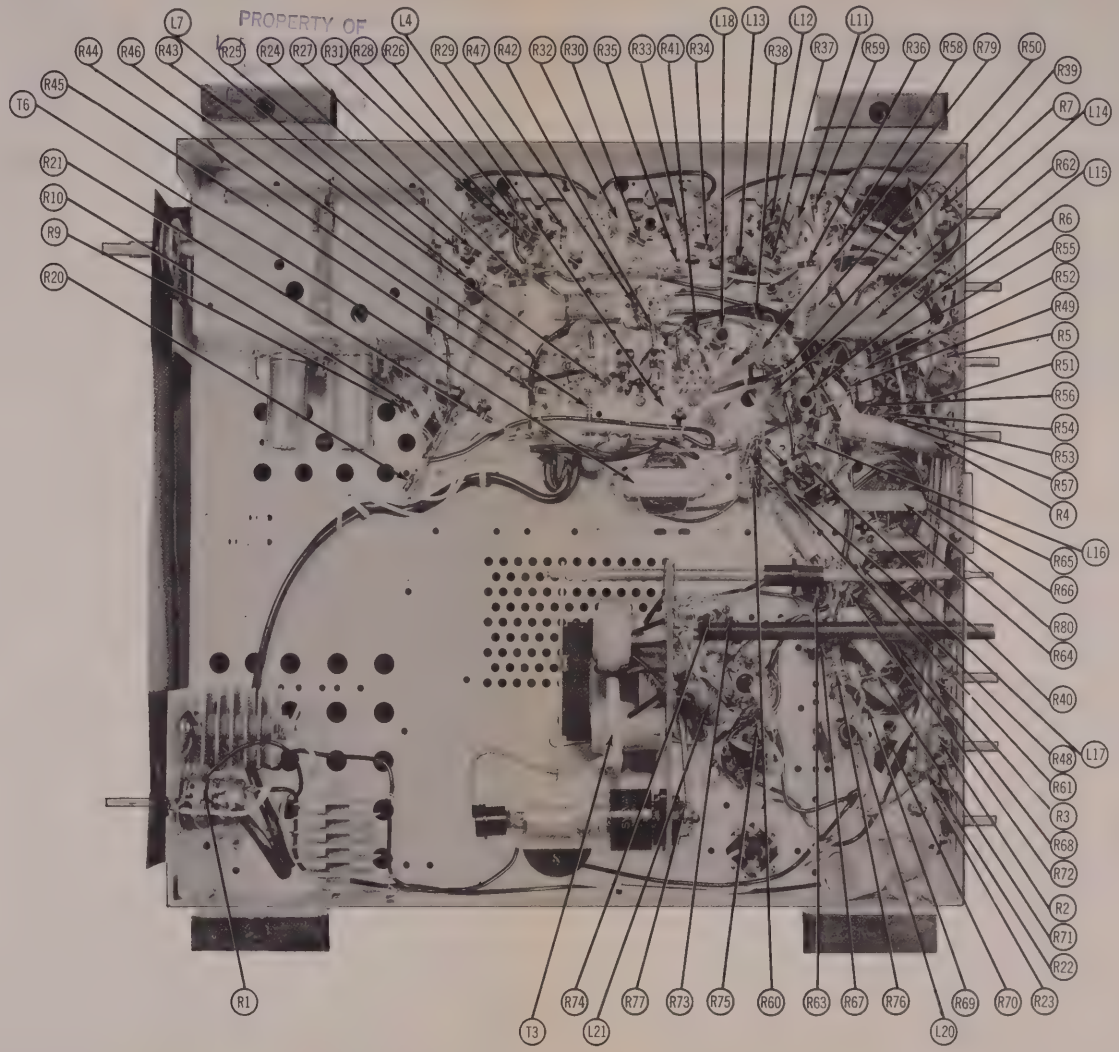

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

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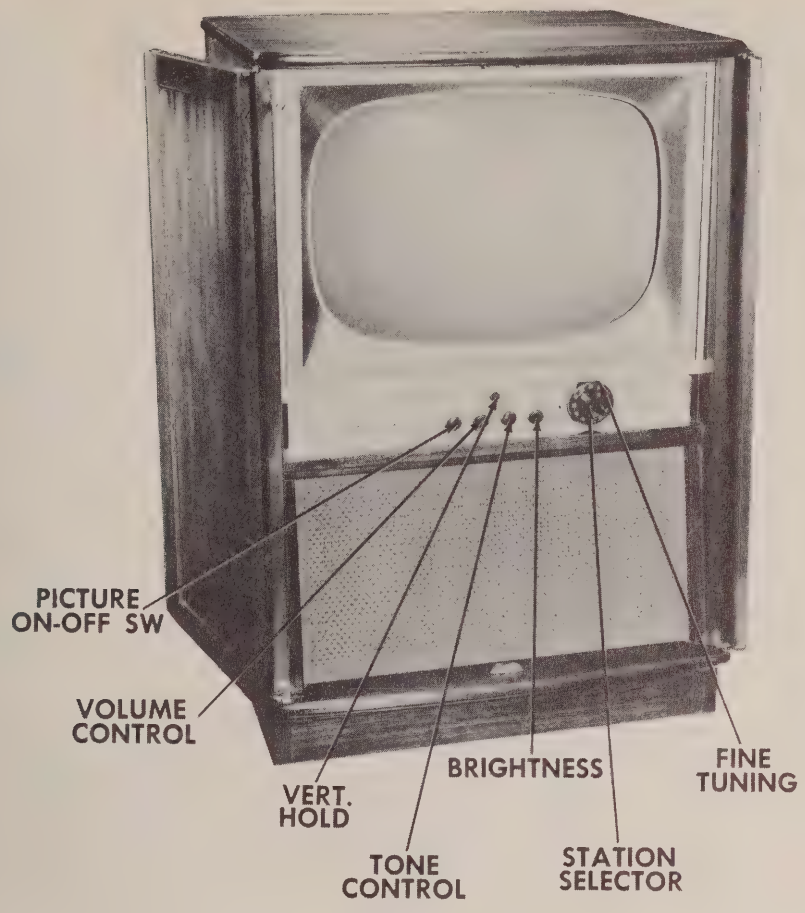

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MAGNAVOX 105L Series(Ch. CT372)

TRADE NAME	Magnavox Models 105L, M, N Series (Ch. CT362, CT363, CT372, CT373, CT374)
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Indiana
TYPE SET	Television Receiver
TUBES	Twenty - one
POWER SUPPLY	110 -120 Volts AC-60 Cycle RATING 1.84 Amp. @117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75 MC, Sound IF 41.25 MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 13
Parts List and Descriptions 14, 15, 16
Photographs
Cabinet-Rear View 13
Capacitor and Alignment Identification 4,9
Chassis - Top View 3
RF Tuner 10, 11
Photographs (Cont)
Resistor and Inductor Identification 12, 17
Resistance Measurements 8
Schematic 2
Servicing in the Field 18
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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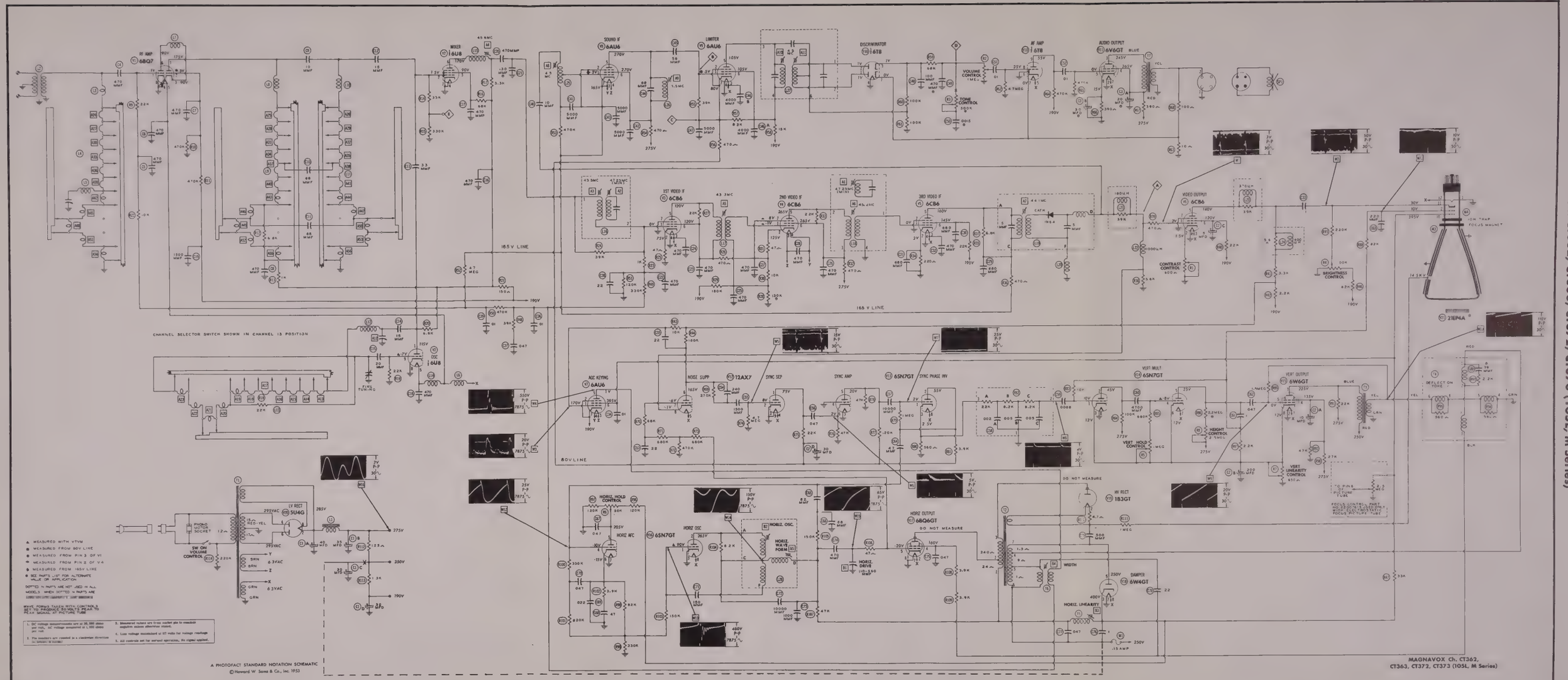

▲ MEASURED WITH VTVM
● MEASURED FROM 80V LINE
■ MEASURED FROM PIN 3 OF V1
◆ MEASURED FROM PIN 2 OF V4
★ MEASURED FROM 165V LINE
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED 'N' PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED 'N' PARTS ARE [illegible]

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. The numbers are rounded in a clockwise direction in groups of three.
3. Measured values are from socket pin to ground unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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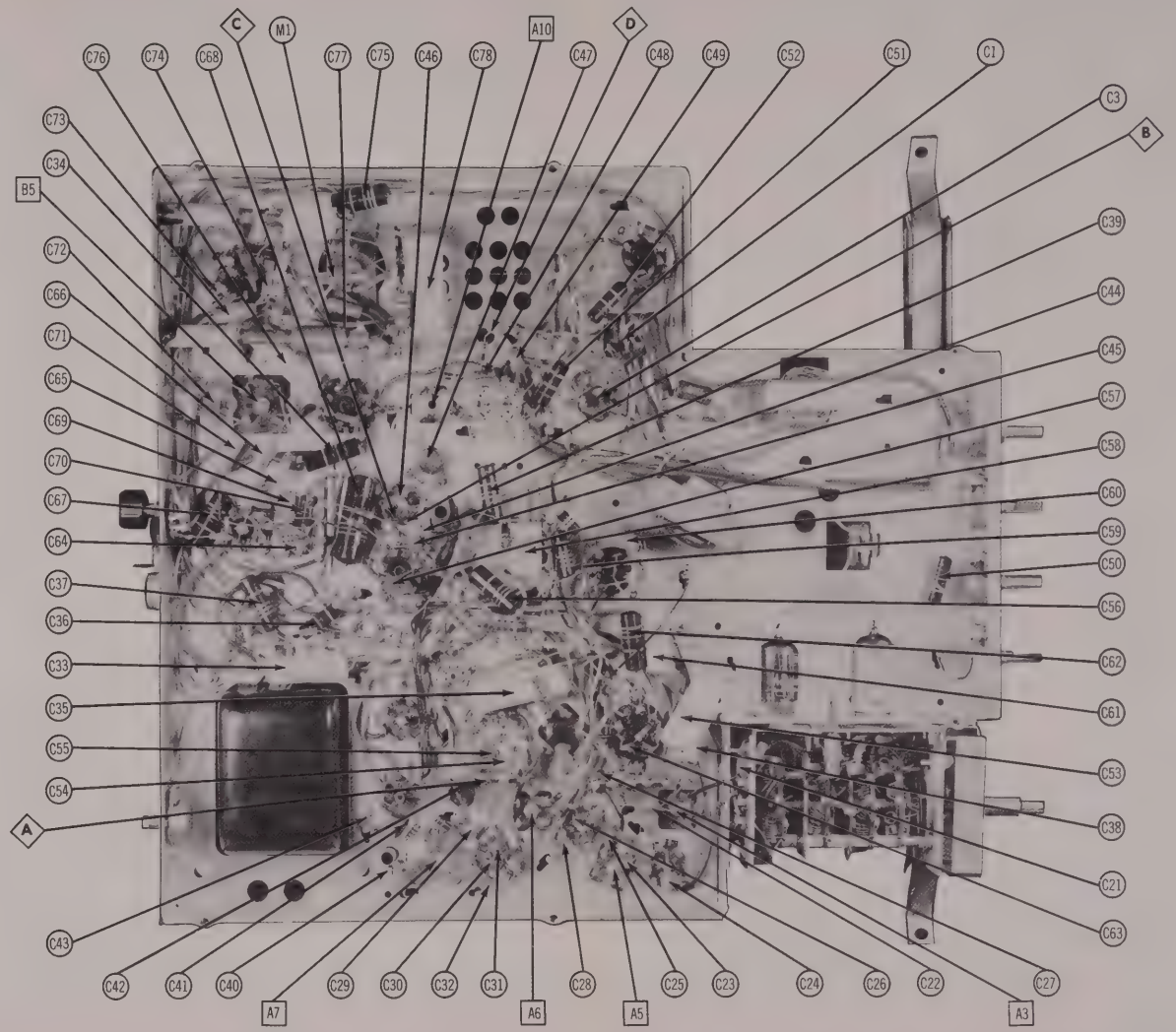
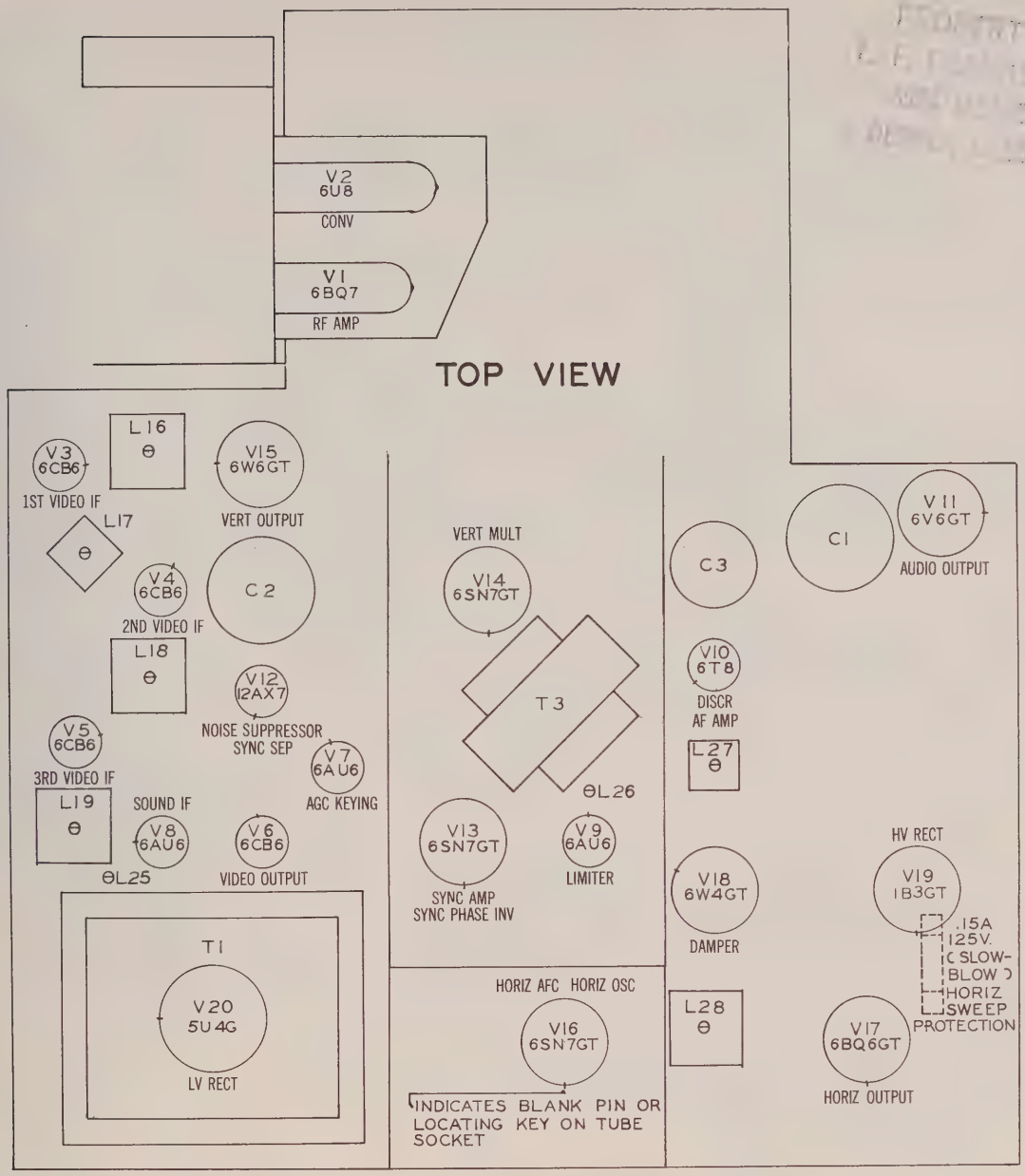
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5,
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V21
Has pic, no sound-V8, V9, V10, V11
Overloaded picture-V7

SYNC FAILURE
No vert. sync.-V13, V14
No horiz. sync.-V13, V16
No vert. or horiz. sync.-V12, V13

SWEEP FAILURE
No raster, has sound-V16, V17, V18, V19, V21 Fuse (M1)
No vertical deflection-V14, V15
Poor vert. linearity or foldover-V14, V15
Poor horiz. linearity or foldover-V16, V17, V18
Narrow picture-V16, V17, V18, V19, V20
Vert. off freq.-V13, V14
Horiz. off freq.-13, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the junction of R50 and R52.
Connect the negative lead of a 4.5 volt battery to the junction of R23 and C22.
Connect the positive leads of both batteries to chassis.
A single 4.5 volt battery with -1.5 volt tap may be used, if convenient.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to converter grid wafer. (Through hole in tuner shield). Low side to chassis.	47.25MC	Any non-interfering channel	DC probe to point (A). Common to chassis.	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	43.5MC	"	"	A3	Adjust for maximum deflection.
3.	"	"	45.6MC	"	"	A4	Adjust for maximum deflection. Do not readjust A3 after peaking A4.
4.	"	"	43.3MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	45.2MC	"	"	A6	"
6.	"	"	44.1MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Leave bias batteries connected as under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Use separate marker generator loosely coupled to the Video IF Strip.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to converter grid wafer. Low side to chassis.	44MC (10MC Swp)	42.75MC 45.75MC 47.25MC	Any non-interfering channel.	Vert. amp. to point (A). Low side to chassis.		Check for response curve similar to Fig. 1 within the limits as shown. If necessary, retouch A5, A6 and A7 for desired response. A7 affects the tilt, A5 and A6 affect marker placement.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to terminal (D) of L18. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru 1Meg to point (B). Common to point (C). Caution: Case of VTVM approximately 85 volts above chassis ground.	A8, A9	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2 volts at VTVM.
9.	"	"	"	"	DC probe to point (D). Common to chassis.	A10, A11	Adjust A10 for maximum deflection. It may be necessary to detune A11 slightly to permit peaking of A10. Adjust A11 for zero deflection. A positive and negative reading will be obtained on either side of the correct setting. For accurate alignment do not change output level of generator from that of Step 8.

OSCILLATOR ALIGNMENT

Oscillator alignment will not be necessary unless the fine tuning control tunes in the extreme clockwise or counter clockwise position, or if it will not tune at all within its tuning range.
If all channels are off center approximately the same amount and direction, it may be possible to correct then by adjusting the trimmer A12. If the range of A12 is insufficient check the space between the "hot" plate of the fine tuner and the tuner cam.
The space should not exceed .015 inches. If necessary, carefully bend the hot plate to come within this distance of the tuner cam.
If some channels tune at one end of the fine tuning control and others tune near the opposite end it will be necessary to make individual oscillator adjustments.
Loosely couple an RF signal generator to the grid of the First IF Amplifier Tube (V3) and tune it accurately to 45.75MC.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 2	Through matching pad (Fig. 2) to antenna terminals.	213MC (10MC Swp)	211.25MC	13	Vert. amp. to point (A) Low side to chassis.	L12	Compress or expand coil to make markers coincide on response curve.
11.	"	"	207MC (10MC Swp)	205.25MC	12	"	A13	Adjust position of coils to make markers coincide on response curve.
			201MC (10MC Swp)	199.25MC	11		A14	
			195MC (10MC Swp)	193.25MC	10		A15	
			189MC (10MC Swp)	187.25MC	9		A16	
			183MC (10MC Swp)	181.25MC	8		A17	
			177MC (10MC Swp)	175.25MC	7		A18	
12.	"	"	85MC (10MC Swp)	83.25MC	6	"	A19	Compress or expand coils to make markers coincide on response curve.
			79MC (10MC Swp)	77.25MC	5		A20	
			69MC (10MC Swp)	67.25MC	4		A21	
			63MC (10MC Swp)	61.25MC	3		A22	
			57MC (10MC Swp)	55.25MC	2		A23	
13.	Recheck channels 13 through 7 (steps 10 and 11).							

ALIGNMENT INSTRUCTIONS (CONT.)

ANTENNA, RF AND CONVERTER ALIGNMENT

Antenna coils are mounted on the rear wafer, RF coils on the second wafer from rear, and the converter coils on the third wafer from the rear.
The RF wafer has B+ on it and should not be touched with the hand or a metal tool.
The oscillator coils (fourth wafer from rear) have been properly adjusted during Oscillator Alignment and should not be touched.
The RF tuner has been properly aligned at the factory and should not require adjustment unless tubes are replaced in the tuner.
Careful selection of the replacement tube may eliminate the necessity of tuner re-alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Fig. 2	Through matching pad (Fig. 2) to antenna terminals.	213MC	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	L3, L8 L10	Compress or expand in order given for response curve similar to Fig. 3.
15.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A24, A25, A26	Adjust position of coils in order given for response similar to Fig. 3.
			201MC (10MC Swp)	199.25MC 203.75MC	11		A27, A28, A29	
			195MC (10MC Swp)	193.25MC (197.75MC	10		A30, A31, A32	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A33, A34, A35	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A36, A37, A38	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A39, A40, A41	
16.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A42, A43, A44	Compress or expand coils for response curve similar to Fig. 3.
			79MC (10MC Swp)	77.25MC 81.75MC	5		A45, A46, A47	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A48, A49, A50	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A51, A52, A53	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A54, A55, A56	

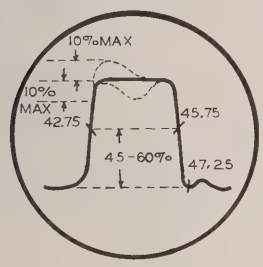


FIG 1

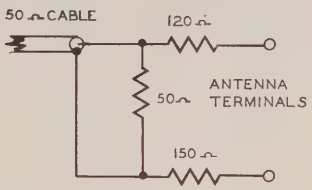


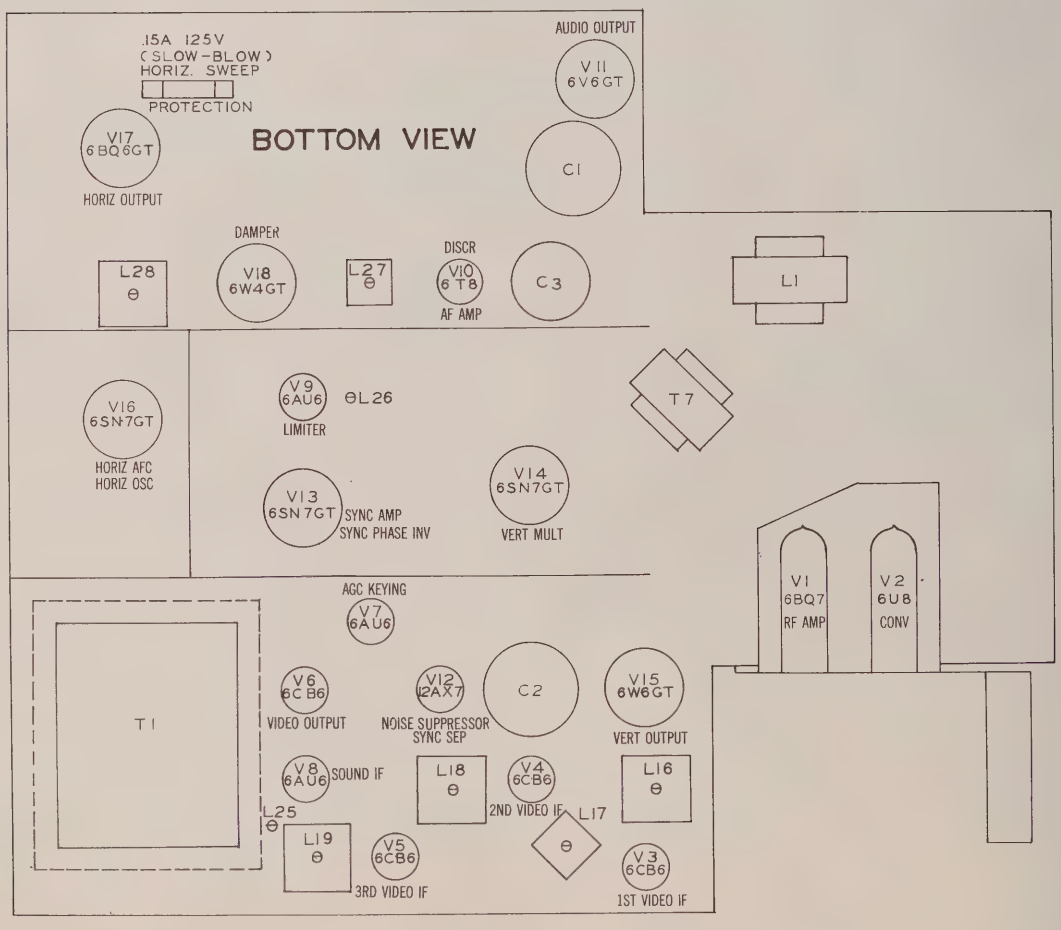
FIG 2

FIG 3

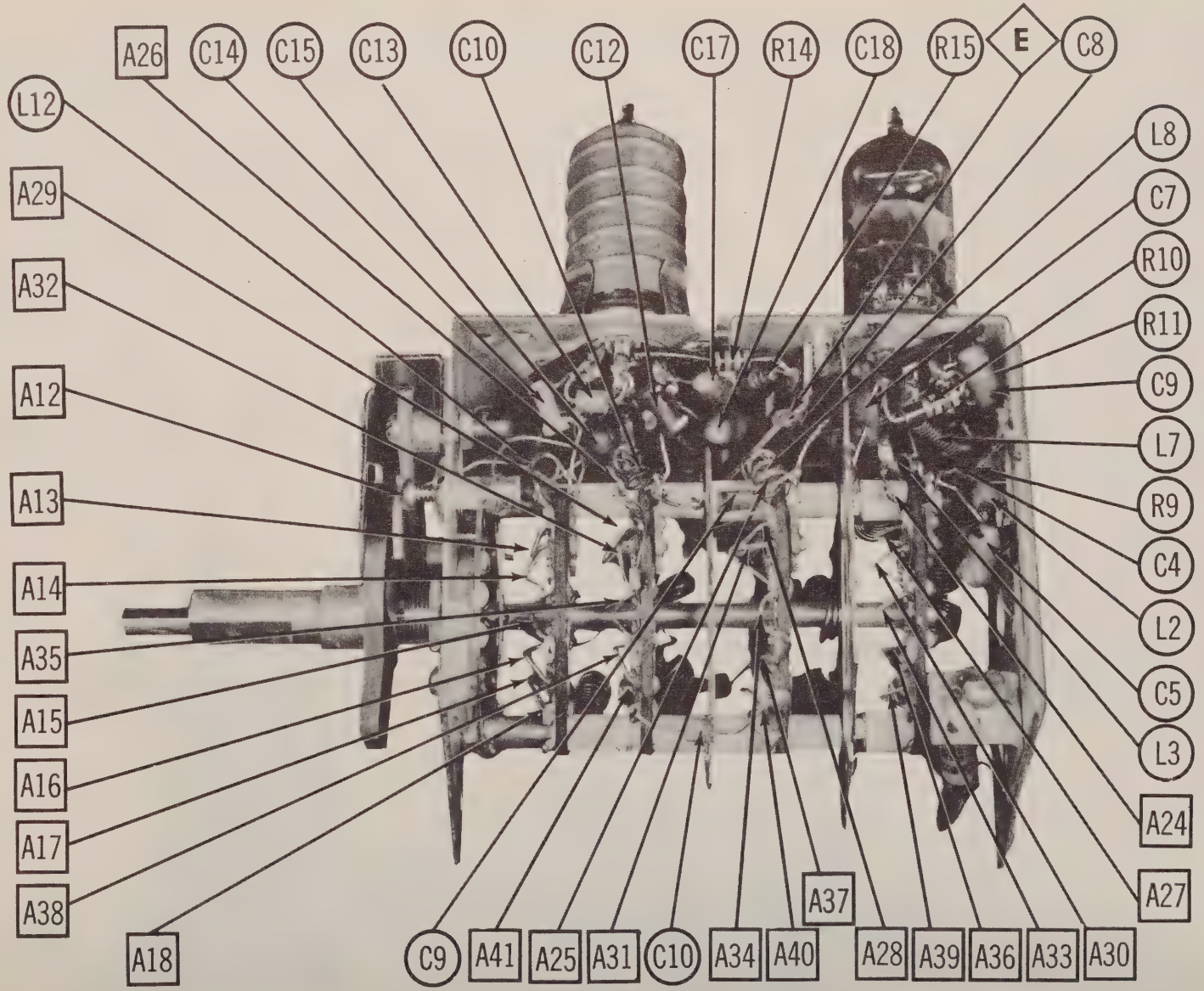
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	† 2.5KΩ	† 245KΩ	INF	0Ω	.1Ω	INF	950KΩ	0Ω	0Ω
V 2	6U8	† 8.3KΩ	365KΩ	† 69KΩ	0Ω	.1Ω	† 4.8KΩ	0Ω	0Ω	22KΩ
V 3	6CB6	120KΩ	47Ω	.1Ω	0Ω	† 130KΩ	† 130KΩ	0Ω		
V 4	6CB6	† 120KΩ	† 130KΩ	#.1Ω	#0Ω	† 510Ω	† 510Ω	†130KΩ		
V 5	6CB6	.1Ω	220Ω	.1Ω	0Ω	#470Ω	† 23KΩ	0Ω		
V 6	6CB6	6.1KΩ	220Ω	.1Ω	0Ω	† 7KΩ	† 23KΩ	0Ω		
V 7	6AU6	† 13.5KΩ	† 1.4KΩ	#.1Ω	#0Ω	450KΩ	▪33KΩ	† 1.4KΩ		
V 8	6AU6	#470KΩ	#0Ω	#0Ω	#.1Ω	† 510Ω	† 510Ω	5.7Meg		
V 9	6AU6	▲39KΩ	▲0Ω	.1Ω	0Ω	† 16KΩ	† 16KΩ	† 24.5KΩ		
V 10	6T8	100KΩ	100KΩ	170KΩ	0Ω	.1Ω	0Ω	10Ω	4.7Meg	†470KΩ
V 11	6V6GT	0Ω	0Ω	† 980Ω	† 430Ω	470KΩ	INF	.1Ω	390Ω	
V 12	12AX7	▲22KΩ	4.7Meg	0Ω	.1Ω	.1Ω	† 185KΩ	1.2Meg	5.6KΩ	0Ω
V 13	6SN7GT	▲1Meg	▲3.9KΩ	560Ω	0Ω	▲56KΩ	47KΩ	0Ω	.1Ω	
V 14	6SN7GT	12.5KΩ	† 100KΩ	260Ω	800KΩ	† 3.6Meg	260Ω	.1Ω	0Ω	
V 15	6W6GT	84KΩ	0Ω	† 835Ω	† 20KΩ	1.5Meg	2.4KΩ	.1Ω	260Ω	
V 16	6SN7GT	480KΩ	▪47KΩ	0Ω	1.5Meg	▪130KΩ	410KΩ	0Ω	.1Ω	
V 17	6BQ6GT	470KΩ	.1Ω	1.2Meg	† 9.5KΩ	1.2Meg	1.2Meg	0Ω	0Ω	TOP CAP ▪30Ω
V 18	6W4GT	▪33KΩ	▪120KΩ	290KΩ	INF	† 165Ω	INF	0Ω	.1Ω	
V 19	1B3GT	PINS 1 TO 8 HAVE INF RESISTANCE								TOP CAP ▪270Ω
V 20	5U4G	INF	35KΩ	INF	15Ω	INF	16.8Ω	INF	35KΩ	
V 21	21EP4A	0Ω	85KΩ	PIN 10 ▪33KΩ	PIN 11 † 250KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V20.
# MEASURED FROM 165 VOLT LINE.
▪ MEASURED FROM PIN 3 OF V18.
▲ MEASURED FROM 80 VOLT LINE.

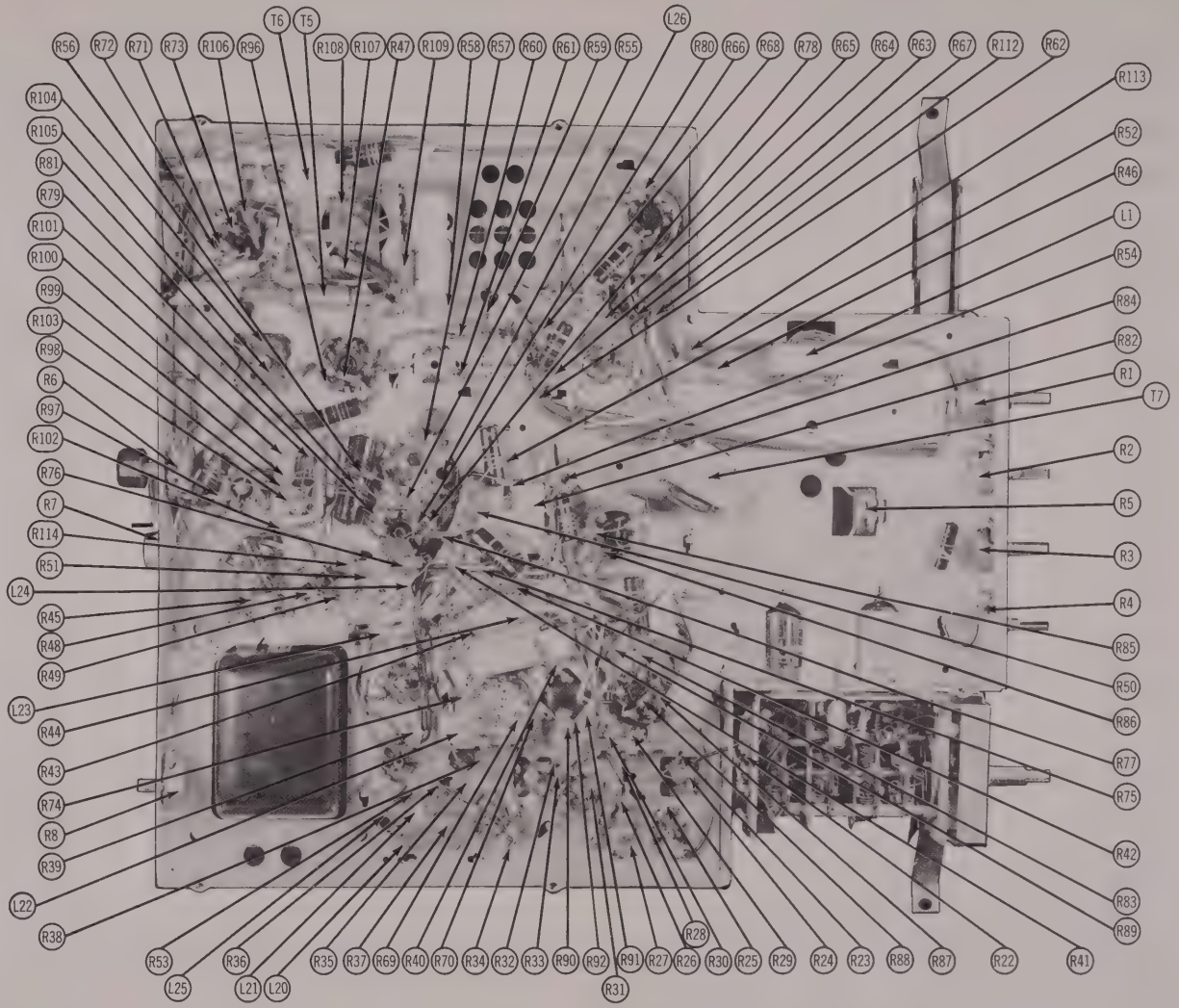


TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE

RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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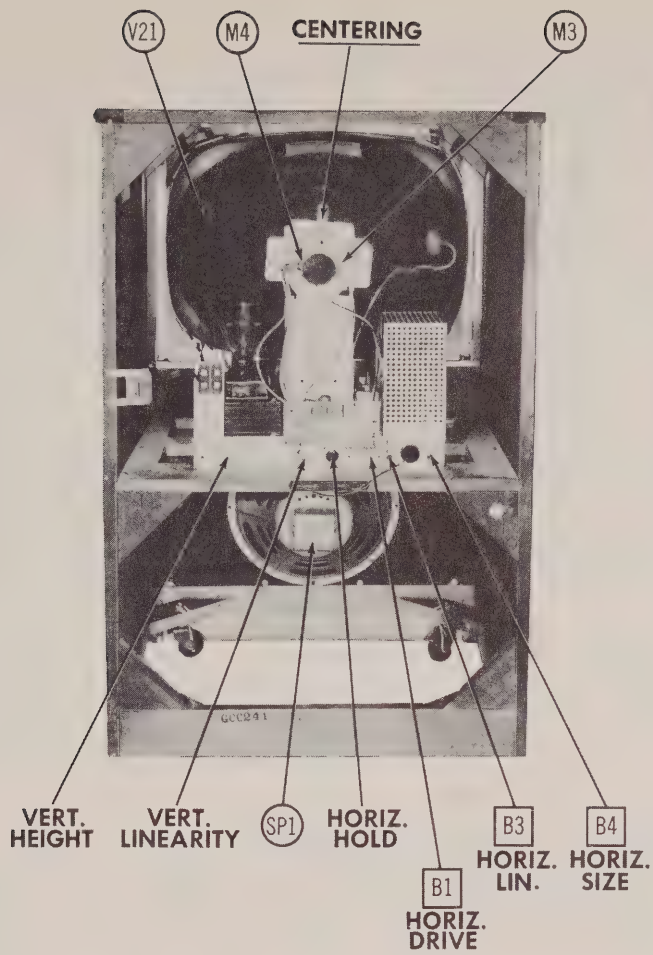


CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Short across terminals C and D of the horizontal oscillator and AFC transformer L27.

Set the horizontal drive trimmer (B1) 1½ turns from tight.

Turn the horizontal hold control fully clockwise and adjust the horizontal oscillator slug (B2) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) horizontal linearity slug (B3) and horizontal size slug (B4) for a picture of proper width and one that is symmetrical from left to right. If B1 is adjusted recheck B2.

HORIZONTAL WAVEFORM ADJUSTMENT

Remove the short from terminals C and D of L27.

Connect the vertical amplifier of an oscilloscope through a 15MMF capacitor to terminal C.

Connect the low side to chassis.

Adjust the horizontal waveform slug (B5), so that broad and narrow peaks of waveform on scope are of equal height, as in Fig. 4.

Remove the oscilloscope. Set brightness control fully clockwise and the horizontal hold control fully clockwise. Adjust B2 until picture is just out of sync, with a blanking bar appearing at left of picture.

Turn B2 in the opposite direction until picture returns to synchronization.

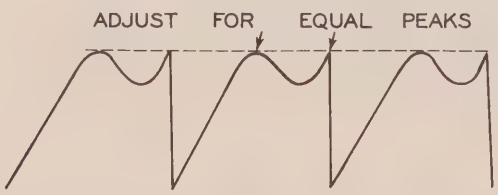


FIG. 4

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6U8	6U8	9-AE	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6CB6	6CB6	7CM	
V7	AGC Keying	6AU8	6AU8	7BK	
V8	Sound IF Amp.	6AU8	6AU8	7BK	
V9	Limiter	6AU8	6AU8	7BK	
V10	Discriminator - AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6V6GT	6V6GT	7S	
V12	Noise Suppressor - Sync Separator	13AX7	13AX7	9A	
V13	Sync Amplifier - Sync Phase Inv.	6SN7GT	6SN7GT	8BD	
V14	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6W6GT	6W6GT	7S	
V16	Horiz. AFC - Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6BQ6GT	6BQ6GT	8AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MAGNAVOX PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21A	21EP4A	21EP4A 21EP4 ①	12D	① Circuit change necessary.
B	21FP4A	21FP4A ① 21FP4 ①	12C	
C	20CP4A		12D	
D	20HP4A ①		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No	CORNELL-DUBILIER TYPE	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	350	270021-43	AFH4-93		DQ92		FP428.4	TVL-4720	
B	±35	350								
C	±30	350								
D	30	350								
C2A	±10	350	270021-46			DQ60		FP432		
B	200	25								
C	±5	350								
D	±30	350								
C3A	±20	350	270023-17	AFH2-38		CQ32		FP330.7	TVL-2627	Note 1
B	30	25								Note 1
C	±5	350								Note 1
C4	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C5	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C6	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C7	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C8	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C9	.1		250209-101							
C10	.68		250209-112		TCZ-.68		NP0K-R68			
C11	.68		250209-112		TCZ-.68		NP0K-R68			
C12	15		250207-5	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C13	3.3		250209-121	SI3.3NP0	TCZ-3.3		NP0K-3R3	ET-5533	5TCC-B-V33	
C14	15		250088-112	SI15NP0	TCZ-15		NP0K-150	ET-5415	5TCC-Q15	
C15	20		250088-113							
C16	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C17	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C18	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C19	1500		250175-3	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C20	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C21	130	500	250159-2050							Note 2
C22	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C23	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C24	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C25	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C26	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C27	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C28	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C29	680		250218-4	BPD-00068	D6-681		GP2K-681	UC-5368	5GA-T68	
C30	680		250218-4	BPD-00068	D6-681		GP2K-681	UC-5368	5GA-T68	
C31	680		250218-4	BPD-00068	D6-681		GP2K-681	UC-5368	5GA-T68	
C32	470		250175-9	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C33	.1	400	250211-13	P488-1	DF-104	PTK4P1		PT401	4TM-P1	
C34	.01	600	250[illegible]-7	P688-01	D6-103	PTK5N1	GP2-333-103	PT611	6TM-D1	
C35	.22	200	25[illegible]2-15	P488-22		PTK4P22		PT4025	2TM-P22	
C36	.01	400	250202-7	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C37	.047	200	250202-11	P288-041	DF-503	PTK4S47		PT4147	2TM-S47	
C38	.22	200	250202-15	P488-22		PTK4P22		PT4025	2TM-P22	
C39	.01	200		P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C40	10		250207-3	SI10NP0	TCZ-10		NP0K-100	ET-541	5TCC-Q1	
C41	5000		250175-1	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C42	5000		250175-1	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C43	5000		250175-1	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C44	68	500	250159-80	1469-00007		5R5Q7			MS-47	
C45	56	500	250159-79							

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C46A	4000		250195-2	BPD-2X004	D6-402	TM5D4	822-004	DCD-524	5HK-2D4	
B	4000				D6-403					
C47	5000		250175-1	BPD-005	DD-502	TM5D5	81L-005	DC-525	5HK-D5	
C48	100		250207-46	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C49	470		250207-50	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	Note 3
C50	.0015	400	25021[illegible]-3	P688-0015	D6-152	PTK5D15	GP1L-152	PT5215	6TM-D15	Note 4
C51	.01	400	25021[illegible]-7	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C52	.01	400	25021[illegible]-7	P488-01	D6-103	PTK4S1	GP2-333-103	PT411	4TM-S1	
C53	.33	200	250202-15	P488-22		PTK4P22		PT4025	2TM-P22	
C54	240	500	250159-56	1469-00025		5R5T25		MCB240		
C55	1500		250175-3	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C56	.047	400	25021[illegible]-11	P488-047	DF-503	PTK4S47		PT4147	4TM-S47	
C57	10000		250175-2	BPD-01	DD-103	TM5I1	821-01	DC-511	5HK-I1	
C58A	.002			P688-002		PTK5D2		PT622		
B	.005		⌀250186-1	P688-005	⌀PC-100	PTK5D5	⌀1405-01	PT625	⌀101C1	
C	.005			P688-005		PTK5D5		PT625		
C59	.0065	400	250202-6	P688-0068	D6-682	PTK5D68	GP2-333-682		6TM-D68	
C60	470	500	250161-24	1464-005		1K45-01		MCB465	MS-35	
C61	.1	400	250211-13	P488-1	DF-104	PTK4P1		PT401	4TM-P1	
C62	.047	400	250211-11	P488-047	DF-503	PTK4S47		PT4147	4TM-S47	
C63	220	500	250218-5	P488-0022	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C64	47	500	250159-78	1469-00006		5R5Q5		MCB235	MS-49	
C65	82	500	250159-81							
C66	68	500	250159-80	1469-00007		5R5Q7			MS-47	
C67	.047	400	250211-11	P488-047	DF-503	PTK4S47		PT4147	4TM-S47	
C68	.47	200	250202-17	P488-47		PT4P5		PT405	2TM-P47	
C69	.022	200	250203-9	P488-022		PTK4S22		PT4122	4TM-S22	
C70	.047	200	250202-11	P288-047	DF-503	PTK4S47		PT4147	2TM-S47	
C71	150	500	250159-51	1469-00015		5R5T15		MCB235	MS-315	
C72	10000	500	250161-47	1464-01				MCB475	MS-11	
C73	1000	500	250160-64	1464-001		1R5D1		MCB255	MS-21	
C74	470	500	250159-90	1469-0005		5R5T5		MCB245	MS-35	
C75	.047	400	250211-11	P488-047	DF-503	PTK4S47		PT4147	4TM-S47	
C76	.1	400	250211-13	P488-1		PTK4P1		PT401	4TM-P1	
C77	.047	400	250211-11	P488-047		PTK4S47		PT4147	4TM-S47	
C78	.22	400	250211-15	P488-22		PTK4P22		PT4025	4TM-P22	
C79	500	20000	250189-1	HV30C	TV3-502	MGM-C20T2	413-501		20DK-T5	
C80	39	1500								Note 5

Note 1. Some Models use two section unit (C3A, C3B) in this application (Part #270023-19)
Note 2. Models having Tuner part #700379-21 use 82MMF in this application (Part #250207-80)
Note 3. When Tone Control is not installed, C49 is 1000MMF (Part #250088-46).
Note 4. When Tone Control is not installed, this item is omitted.
Note 5. Value selected for minimum transients.
⌀ Items C58A, C58B, C58C, R82A, R82B, R82C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No	INSTALLATION NOTES
R1A	600Ω	½	220126-26	Q11-105	AG-8-8	B-5-8	U-4	Contrast
B	Shaft		Not Req.	Not Req.	F3-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	76-1	SWB	Not Req.	UB-26	Attach to R1A.
R2A	1Meg	½	220126-25	Q13-137	AG-63-2	B-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	F3-3	Not Req.	Not Req.	Attach to R2A.
R3A	500KΩ	½	220126-28	Q13-133	AG-60-2	B-60	U-48	Tone - See Note.
B	Shaft		Not Req.	Not Req.	F3-3	Not Req.	Not Req.	Attach to R3A.
R4A	100KΩ	½	220126-24	Q11-138	AG-49-8	B-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	F3-3	Not Req.	Not Req.	Attach to R4A.
R5A	1Meg	½	220126-27	Q11-137	AG-61-8	B-69	U-54	Vertical Hold
B	Shaft		Not Req.	Not Req.	RS-5	Not Req.	Not Req.	Attach to R5A.
R6A	50KΩ	½	220128-9	Q11-123	AG-44-8	B-31	U-35	Horizontal Hold
B	Shaft		Not Req.	Not Req.	F3-3	Not Req.	Not Req.	Attach to R6A.
R7	650Ω	1	220129-1	Q11-239	AG-94-8	AB-83	SU-565	Vert. Linearity-Wire Wound
R8A	2.5Meg	½	220078-5	Q11-231	AG-96-8	AK-1	Not Req.	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A.

Note: Not used in all Models.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R9	22kΩ	½	230104-78		
R10	470KΩ	½	230104-96		
R11	470kΩ	½	230104-94		
R12	6800Ω	½	230104-72		
R13	1900Ω	½	230104-92	BTS-1000	
R14	33kΩ	½	230104-80		
R15	330KΩ	½	230104-92	BTS-330K	
R16	68kΩ	½	230104-84	BTS-68K	
R17	3300Ω	½	230104-68	BTS-3300	
R18	22kΩ	½	230104-78		
R19	22kΩ	½	230104-78		
R20	6800Ω	1	230105-72		
R21	150Ω	½	230104-52	BTS-150	
R22	10kΩ	½	230104-74	BTS-10K	
R23	1000Ω	½	230104-62	BTS-1000	
R24	39kΩ	½	230104-81		
R25	47Ω	½	230104-49		
R26	470Ω	½	230104-58	BTS-470	
R27	22kΩ	½	230104-78		
R28	150kΩ	½	230104-92		Note 2
R29	180kΩ	½	230104-89	BTS-180K	
R30	10kΩ	½	230104-74	BTS-10K	
R31	47Ω	½	230104-46		
R32	470Ω	½	230104-58	BTS-470	
R33	22kΩ	½	230104-78		
R34	220Ω	½	230104-54	BTS-220	
R35	22kΩ	½	230104-78		
R36	470Ω	½	230104-58	BTS-470	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R37	6800Ω 5%	½	230104-72	BTS-6800-5%	
R38	5600Ω	½	230104-71	BTS-5600	
R39	470Ω	½	230104-58		
R40	22kΩ	1	230105-78	BTA-22K	
R41	3300Ω	1	230105-68	BTA-3300	
R42	2200Ω	1	230105-66	BTA-2200	
R43	10kΩ	½	230104-74	BTS-10K	
R44	180kΩ	½	230104-89	BTS-180K	
R45	220kΩ	½	230104-90	BTS-220K	
R46	82kΩ	½	230104-85	BTS-82K	
R47	33kΩ	½	230104-80	BTS-33K	
R48	39kΩ	½	230104-81	BTS-39K	
R49	330KΩ	½	230104-92	BTS-330K	
R50	470kΩ	½	230104-94	BTS-470K	
R51	120kΩ	½	230104-87	BTS-120K	
R52	4.7Meg	½	230104-106	BTS-4.7Meg	
R53	470kΩ	½	230104-94		
R54	470Ω	½	230104-58	BTS-470	
R55	39kΩ	½	230104-81	BTS-39K	
R56	470Ω	½	230104-58	BTS-470	
R57	8200Ω	½	230104-73	BTS-8200	
R58	15kΩ	½	230105-76	BTA-15K	
R59	68kΩ	½	230104-84	BTS-68K	
R60	100kΩ	½	230104-86	BTS-100K	
R61	100kΩ	½	230104-86	BTS-100K	
R62	4.7Meg	½	230104-106	BTS-4.7Meg	
R63	10Ω	½	230104-39		
R64	470kΩ	½	230104-94	BTS-470K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MAGNAVOX PART No	IRC PART No.	NOTES
R65	470KΩ	½	230104-94	BTS-470K	
R66	390Ω	½	230105-57	BTA-390	
R67	390Ω	1	230105-57	BTA-390	
R68	100Ω	½	230104-50	BTS-100	
R69	270KΩ	½	230104-91	BTS-270K	
R70	68kΩ	½	230104-84	BTS-68K	
R71	680KΩ	½	230104-98	BTS-680K	
R72	470KΩ	½	230104-94	BTS-470K	
R73	680KΩ	½	230104-98	BTS-680K	
R74	4.7Meg	½	230104-106	BTS-4.7Meg	
R75	22KΩ	½	230104-78	BTS-22K	
R76	47KΩ	½	230104-82	BTS-47K	
R77	120KΩ	½	230104-87	BTS-120K	
R78	47KΩ	½	230104-82	BTS-47K	
R79	1Meg	½	230104-98	BTS-1Meg	
R80	560Ω	½	230104-59	BTS-560	
R81	3900Ω	½	230104-69	BTS-3900	
R82A	22KΩ	½		BTS-22K	
B	8200Ω	½	⌀250188-1	BTS-8200	
C	8200Ω	½		BTS-8200	
R83	10KΩ	½	230104-74	BTS-10K	
R84	100KΩ	1	230105-86	BTA-100K	
R85	680KΩ	½	230104-98	BTS-680K	
R86	2.2Meg	½		BTS-2.2Meg	Note 1
R87	2200Ω	½	230104-66	BTS-2200	
R88	82KΩ	½	230104-85	BTS-82K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R89	1.5Meg	½	230104-100	BTS-1.5Meg	
R90	27KΩ	1	230105-79	BTA-27K	
R91	22KΩ	1	230105-78	BTA-22K	
R92	47KΩ	½	230104-82	BTS-47K	
R93	220Ω	½		BTS-2200	
R94	560Ω	½		BTS-560	
R95	560Ω	½		BTS-560	
R96	120KΩ	½	230104-87	BTS-120K	
R97	120KΩ	½	230104-87	BTS-120K	
R98	82KΩ	½	230104-85	BTS-82K	
R99	330KΩ	½	230104-92	BTS-330K	
R100	330KΩ	½	230104-92	BTS-330K	
R101	820KΩ	½	230104-97	BTS-820K	
R102	390Ω	½	230104-69	BTS-3900	
R103	150KΩ	½	230104-88	BTS-150K	
R104	8200Ω	½	230104-73	BTS-8200	
R105	150KΩ	½	230104-88	BTS-150K	
R106	47Ω	½	230104-46		
R107	47KΩ	1	230105-82	BTA-47K	
R108	3900Ω	2	230106-69	BTB-3900	
R109	3900Ω	2	230106-69	BTB-3900	
R110	4.7Ω	½	230107-1		
R111	1Meg	1	230105-98		
R112	125Ω	10	240021-11	3 3/4A-125	
R113	1500Ω	5	240021-30	3 3/4A-1250	
R114	220KΩ	1	230105-90	BTA-220K	

⌀ Items R82A, R82B, R82C, C58A, C58B, C58C are combined in one unit.
Note 1. Some Models use a 1.5Meg resistor in this application.
Note 2. Some Models use a 330KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	590VCT	5VAC	6.3VAC	300064-1			TP-319	R-39BC	
	⑥1.84A	.230ADC	⑧3A	⑨.86A						
				SEC. 4						
				6.3VAC						
				⑤9.1A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA TYPE No.	NOTES
T2	264Ωtap	11.5Ω tap	320061-1	A-8130 ⑫⑬	HV0-7 ⑭⑮	TFB-5 ⑮⑯	D-14 ⑰⑦		Horiz. Output Trans.
	⑫24Ω	⑫10, 10Ω							
		SEC. 2							
T3	870Ω	14Ω	320060-1	A-8113	A-3038 ⑱	T80-9	A-99X ⑱		Vert. Output Trans.
T4A	15Ω		360536-1	DY-9 ⑲	MDF-70 ⑲	TV-5 ⑲	Y-31 ⑲	306DI ⑲	Horiz.Deflection Coils
B	46Ω								Vert. Deflection Coils
T5	9Ω		360517-1		MWC-2 ⑩	TL-3 ⑪		209RI ⑪	Horiz. Linearity Coil
T6	3Ω	58Ω	360521-1						Width and AGC Coil

① Use with width coil WC-5.
② Wire as shown on installation schematic Nos. 3 and 5B.
③ Use with width coil MWC-1.
④ Wire as shown on installation schematic No. 3.
⑤ Drill new mounting holes.
⑥ Use width coil (with AGC winding) with approximate range of 4-29 millihenries.
⑦ Use with width coil WC-1L.
⑧ Drill new mounting hole.
⑨ Use original deflection coil network.
⑩ Enlarge mounting hole.
⑪ Do not use tap.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	5.5KΩ	9.25Ω	548Ω	.6Ω	320061-1	A-3877 ①	A-2930 ①	R0-9 ①	S-3X ①	

① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MAGNAVOX PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3.25Ω	580020	12J11	12A31	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: MAGNAVOX PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No
L1	.230A	38.5Ω	.43HY	B320058-1	C-3326 ①	C-3991 ①		C-17X ①

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	MAGNAVOX PART No.	MILLER PART No.	IRC PART No.	
L2	Ant. Trans.	.1ΩCT	.1Ω				Channel 13
L3	Ant. Coil	0Ω					
L4	Ant. Coils	0Ω					
L5	RF Choke	3Ω				CLA	3.3 Microhenries
L6	Fil. Choke	.22Ω				CLA	.47 Microhenry
L7	Neutralizing Coil	0Ω					Channel 13
L8	RF Coil	0Ω					
L9	RF Coils	0Ω					
L10	Mixer Grid Coil	0Ω					Channel 13
L11	Mixer Grid Coils	0Ω					Channel 13
L12	Osc. Coil	0Ω					
L13	Osc. Coils	0Ω					
L14	Fil. Choke	.22Ω				CLA	.47 Microhenry
L15	Conv. Plate	.2Ω					Includes Trap
L16	1st Video IF	.2Ω		360545-1			
L17	2nd Video IF	.1Ω	.1Ω	360548-1			Includes Trap
L18	3rd Video IF	.1Ω	.1Ω	360546-1			Includes 1N64 crystal det., 5MMF Cap.
L19	4th Video IF	.1Ω	.1Ω	360549-1			and 6 Microhenries series peaking coil
L20	RF Choke	.8Ω		360443-23	4610		6 Microhenries.
L21	Series Peaking Coil	6Ω		360443-13	6179 *		180 Microhenries, wound on 39KΩ resistor
L22	Shunt Peaking Coil	25Ω		360443-27	4652		1000 Microhenries
L23	Series Peaking Coil	9Ω		360443-13	4648*		370 Microhenries; Wound on 39KΩ resistor.
L24	Shunt Peaking Coil	9.5Ω		360443-14	4648■		400 Microhenries; Wound on 5.6KΩ resistor.
L25	1st Sound IF	3.4Ω		360535-1	1470		Tapped at .7Ω
L26	2nd Sound IF	1.2Ω		360481-1	1470		
L27	Discriminator	1.7Ω	1.8ΩCT	360512-2	6204		
L28	Horiz. Osc.	70Ω		360499-1	6183		Pri. winding tapped @ 48Ω, Horiz. Stabilizer winding - 46Ω

* Parallel with 39KΩ resistor.
■ Parallel with 5.6KΩ resistor.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAGNAVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo P/T	15/100A 125V	180475-4		315.150 (3AG-15/100A-Slo-Blo-P/T)		MDV15/100	

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	RF Tuner	700379-20	
M3	Focus Magnet	360504-1	Includes centering device.
M4	Ion Trap		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the channel selector and fine tuning knobs.

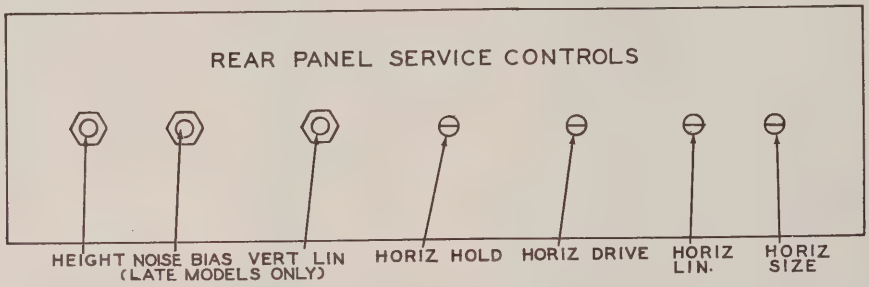
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove two bolts holding wood strip at bottom of safety glass. Remove wood strip. Remove two clamps holding safety glass at the bottom. Remove safety glass by pulling out and down. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator should not be attempted in the field. For proper adjustment See HORIZ: SWEEP CIRCUIT ADJUST MENT, page 13.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Discriminator Secondary (L27) location on top of chassis. (See Tube Placement Chart).

FUSES

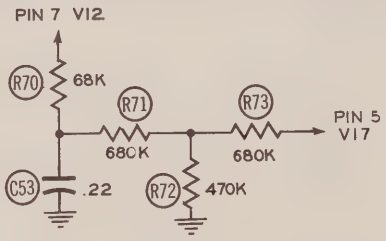
One fuse is used for Horiz. Sweep Circuit protection.(For location, see tube placement chart.)

CENTERING

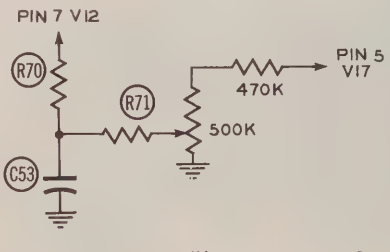
Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

NOISE BIAS CONTROL ADJUSTMENT (SEE CIRCUITS BELOW)

Adjust on weakest station signal that will be received in that area. Turn control until distortion or instability of picture is noted, then back off slightly until distortion or instability just disappears. Check all channels for picture stability and make slight readjustment if necessary.



CIRCUIT USED IN EARLY MODELS



CIRCUIT USED IN LATE MODELS

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 9 wood and 1 metal screws. Remove rear cover.
3. Disconnect speaker plug, VHF and UHF (If any) lead.
4. Remove 4 speaker nuts. Remove speaker (Not necessary for chassis removal).
5. Remove 4 wood screws, and metal CRT support from inside top of cabinet.
6. Remove 6 chassis bolts. Remove chassis.

RCA VICTOR
MODELS 2ES3, 2ES31, 2ES38 (Ch. RS-142)

RCA VICTOR
MODELS 2ES3, 2ES31, 2ES38 (Ch. RS-142)

TRADE NAME	RCA Victor Models 2ES3, 2ES31, 2ES38 (Ch. RS-142)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Automatic Record Changer
TUBES (Three)	Types 12SQ7 AF Amp., 50L6GT Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RCA VICTOR RECORD CHANGER MODEL 930409-5, SEE SIMILAR V-M MODEL 950-PHOTOFACT SET #107-FOLDER 13 or RECORD CHANGER MANUAL CM-3.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL (2ES3 (Ch. RS-142)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	Phono Pre-Amp.	12SQ7	12SQ7	8Q	
V2	Audio Output	50L6GT	50L6GT	7S	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	80	150	75980	PRS150/80-40-20		EDL8415		3N538	R1274	
B	50	150								
C2	.0047	400	73920	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C3	.01	200	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C4	.0022	600	73595	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C5	.027	200	73554							
C6	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	.047	400	73553	P488-047		PTE4S47		PT4147	4TM-S47	
C8	.047	400	73553	P488-047		PTE4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	76885	Q13-137X	AK-98	BT-72	UT-440	Volume Tap ⓐ 220KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	2 Meg	½	75562	Q13-139	AG-66-Z	B-76	U-55	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R3	1.8Meg	½	503518	BTS-1.8Meg	
R4	270KΩ	½	503427	BTS-270K	
R5	100KΩ	½	503410	BTS-100K	
R6	4.7Meg	½	504547	BTS-4.7Meg	
R7	270KΩ	½	503427	BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R8	270KΩ	½	503427	BTS-270K	
R9	150Ω	½	503115	BTS-150	
R10	1500Ω	½	503215	BTS-1500	
R11	33Ω	1	514033		
R12	120Ω	5	72314	1 3/4A-125	

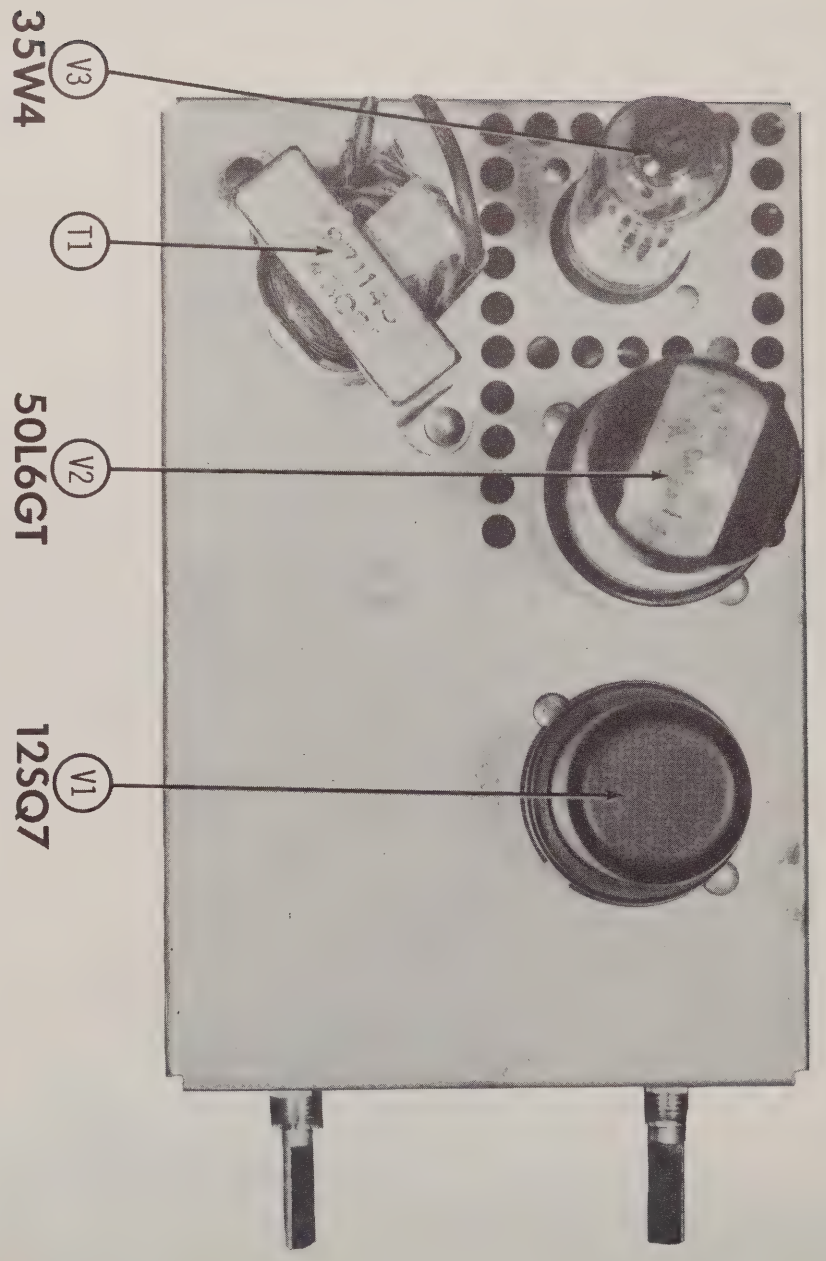
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.7KΩ	3.4Ω	268Ω tap ⓐ 28Ω	.72Ω	75939	A-3336 ①	A-3031			① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	VIKING PART No.	QUAM PART No.	
SP1	4 x 6"	PM	3.4Ω	76886	46J6	46A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	RCA Victor PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	75475	*9-D	Q Q-33			96-0	0-1 or S-1 & 0-3 or S-3	* Complete Arm and cart. assembly

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

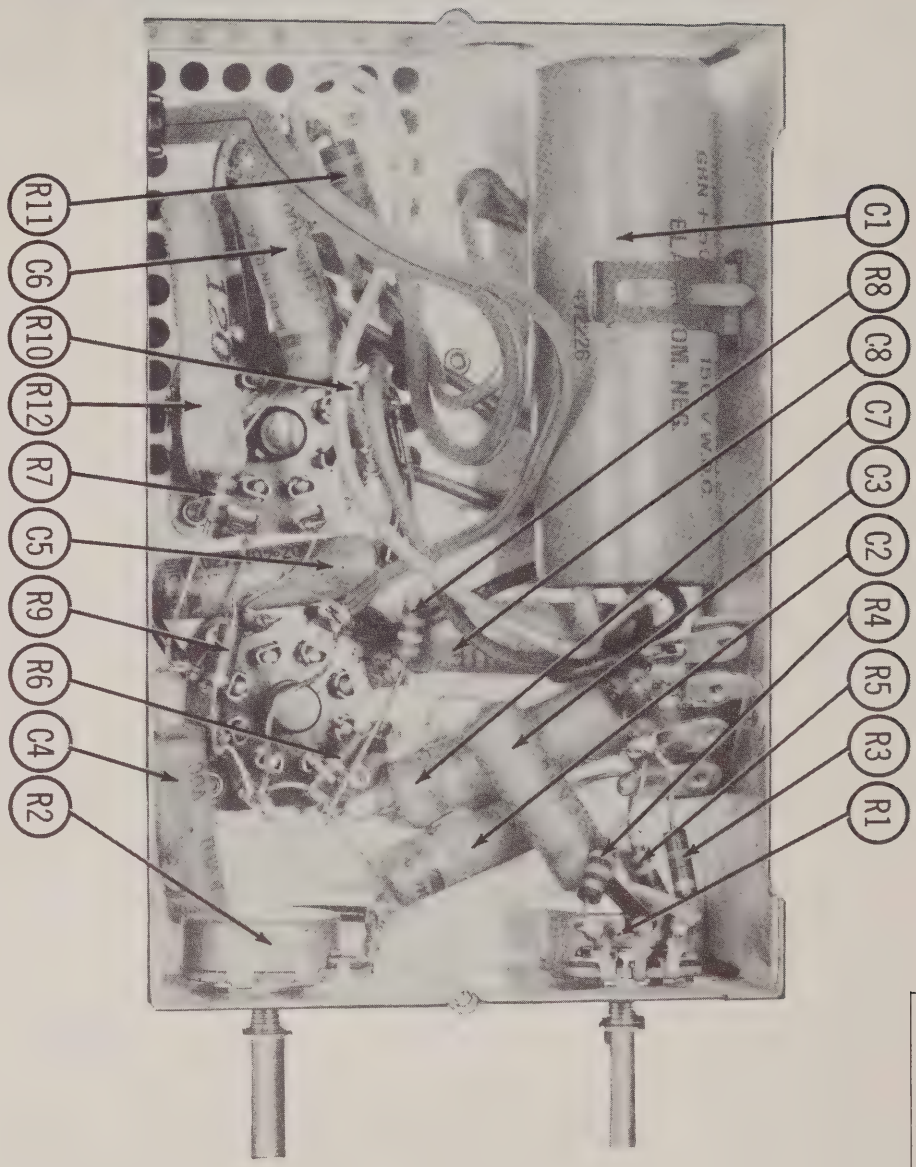
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	WALCO PART No.	JENSEN PART No.	
M2	* 75496 ♦75497	W-44MGS or W-44MGA & W-44A or W-44S	M-74LP or M-75LP & M-74 or M-75	* Micro groove needle ♦ Standard needle

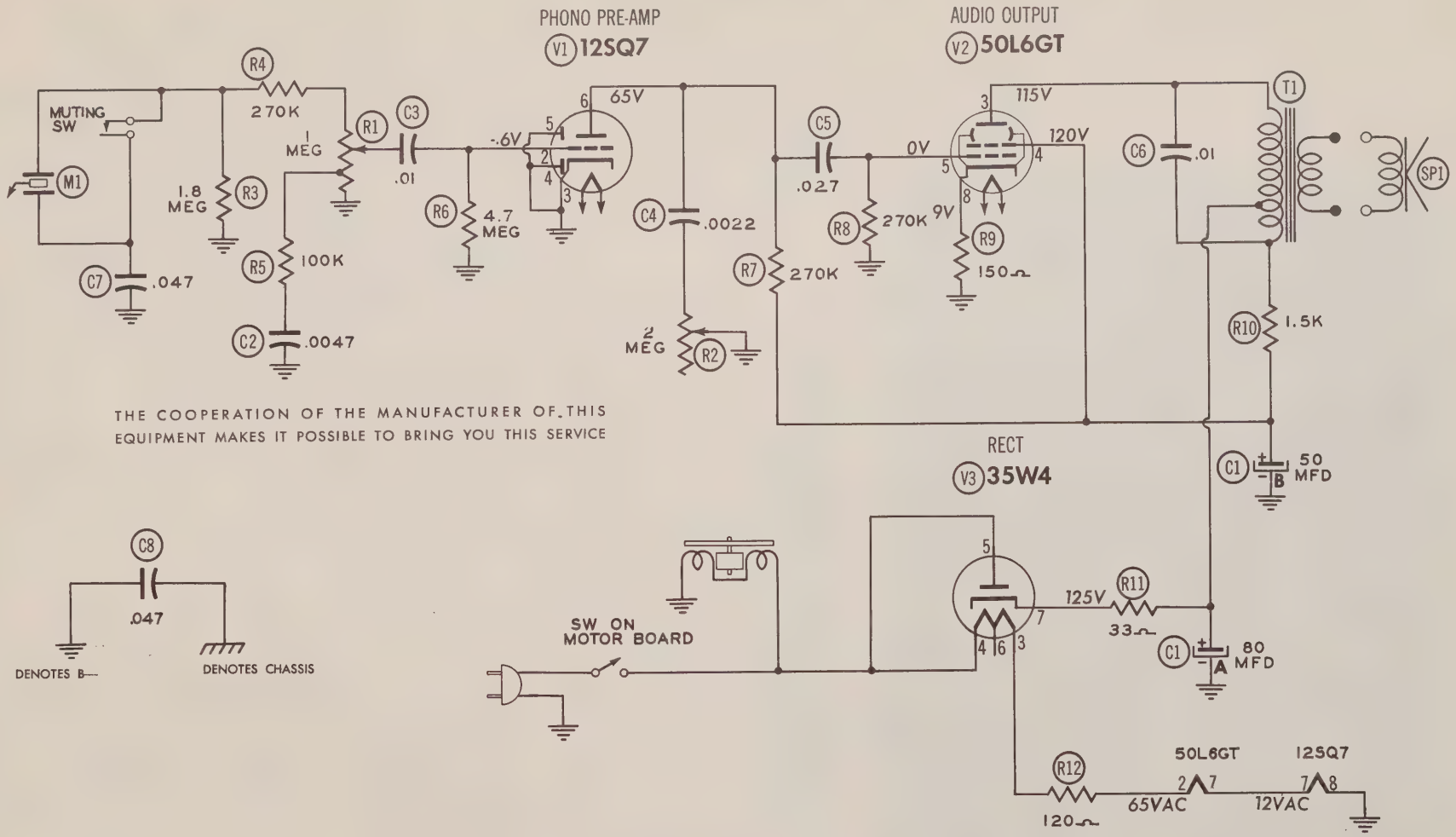
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
	Cabinet Knob	Y2400 77139	

CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL 2ES3 (Ch. RS-142)



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7	INF	5 Meg	0Ω	0Ω	0Ω	*270KΩ	12Ω	0Ω
V 2	50L6	INF	65Ω	*300Ω	*1.5KΩ	270KΩ	20KΩ	12Ω	150Ω
V 3	35W4	INF	20KΩ	180Ω	210Ω	210Ω	200Ω	20KΩ	

FILAMENT RESISTANCE READINGS TAKEN WITH PHONO MOTOR DISCONNECTED
* MEASURED FROM PIN 7 OF V3

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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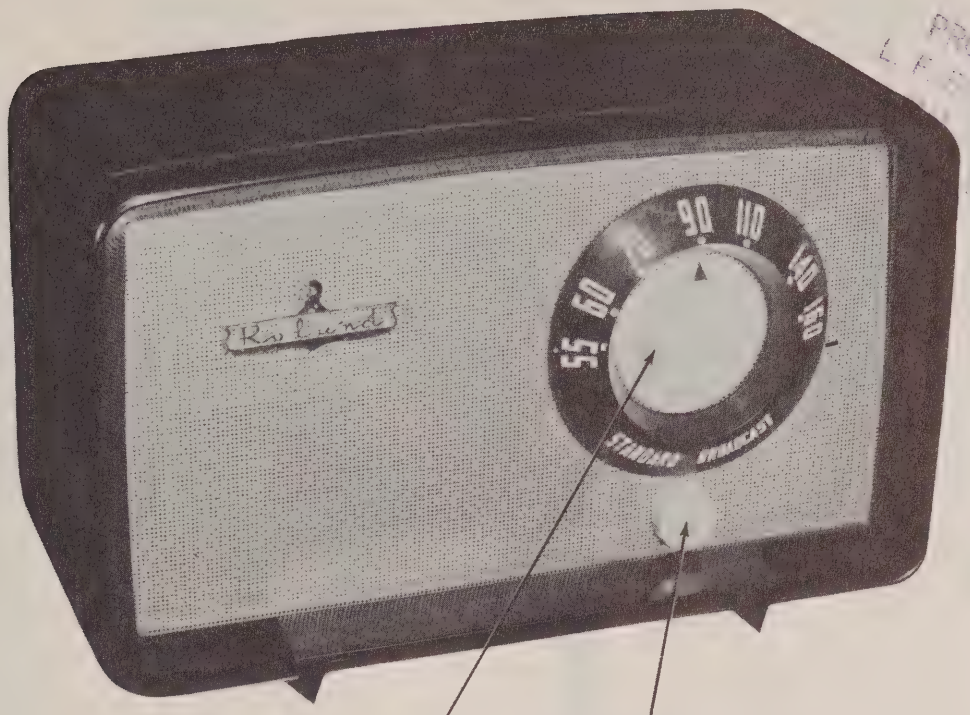
205-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 Volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

PROPERTY
L. F. ANKEN
ST.
ORADO

ROLAND
MODELS 5T1E



TUNING CONTROL

VOLUME CONTROL ON-OFF SW.

ROLAND
MODELS 5T1E

TRADE NAME	Roland Model 5T1E
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1610KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer to last reference mark at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

ROLAND
MODEL 5T1E

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTE
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150		PRS150/50-30		EDL5315		2N520	TVA-2453	Red
B	30	150								Blue
C2	.05	400		P488-05	DF-203	PTE4S5		PT415	4TM-S5	
C3	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C4	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C5A	220									
B	.005									
C	.005				♦PC-150		♦1408-01		♦103C4	
D	250									
E										
C6	.01	600		P688-01		PTE6S1		PT611	6TM-S1	
C7	.01	600		P688-01		PTE6S1		PT611	6TM-S1	
C8	.1	400		P488-1		PTE4P1		PT401	4TM-P1	

♦ Items C5A, C5B, C5C, C5D, C5E, R5A, R5B, R5C are combined in one unit.
When replacing items separately C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-51	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	10KΩ	1/2		BTS-10K	
R3	150Ω	1/2		BTS-150	
R4	2.2Meg	1/2		BTS-2.2Meg	
R5A	6.8Meg	1/2	♦	BTS-6.8Meg	
B	470KΩ	1/2		BTS-470K	
C	470KΩ	1/2		BTS-470K	

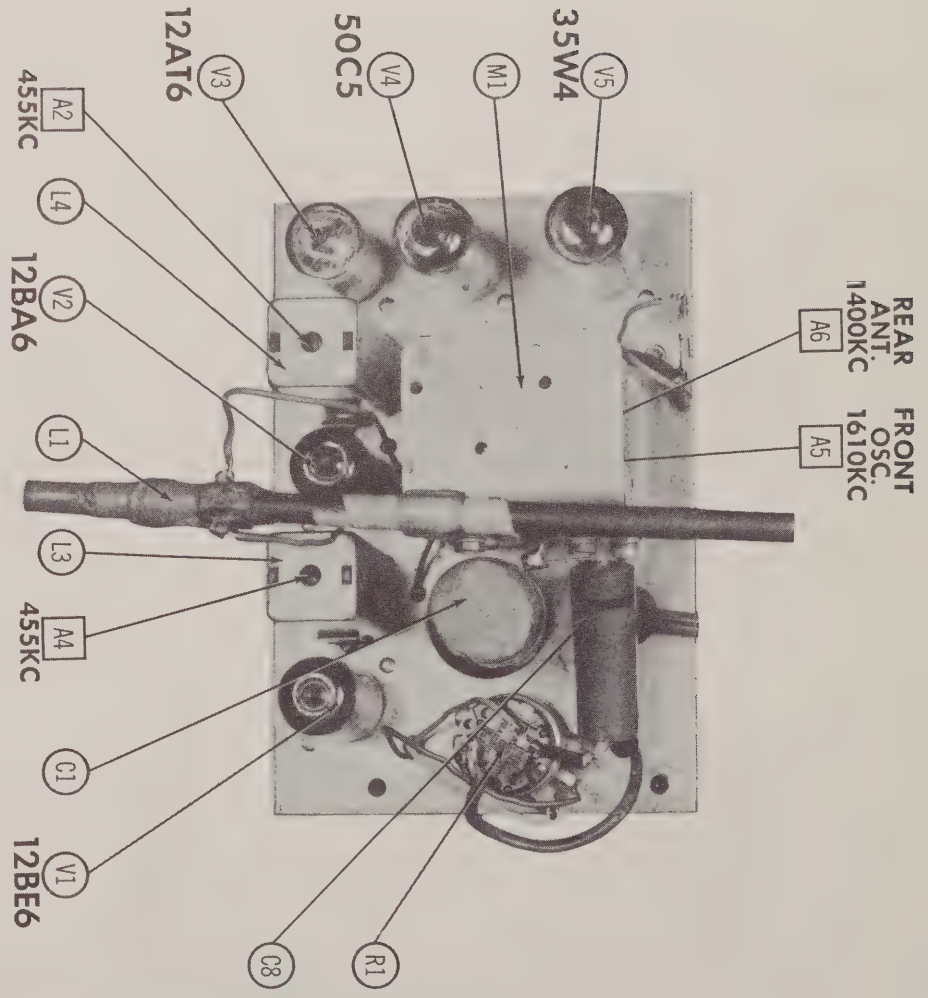
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R6	150Ω	1		BTA-150	
R7	2200Ω	1		BTA-2200	
R8	18Ω	½			

♦ Items R5A, R5B, R5C, C5A, C5B, C5C, C5D, C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ROLAND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.16KΩ	3.3Ω	168Ω	.44Ω		A-3332	A-3025	RO-2 ①	S-2X ①	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω		ST-115 Mod. P4-X	4A07	

COILS (RF-IF)

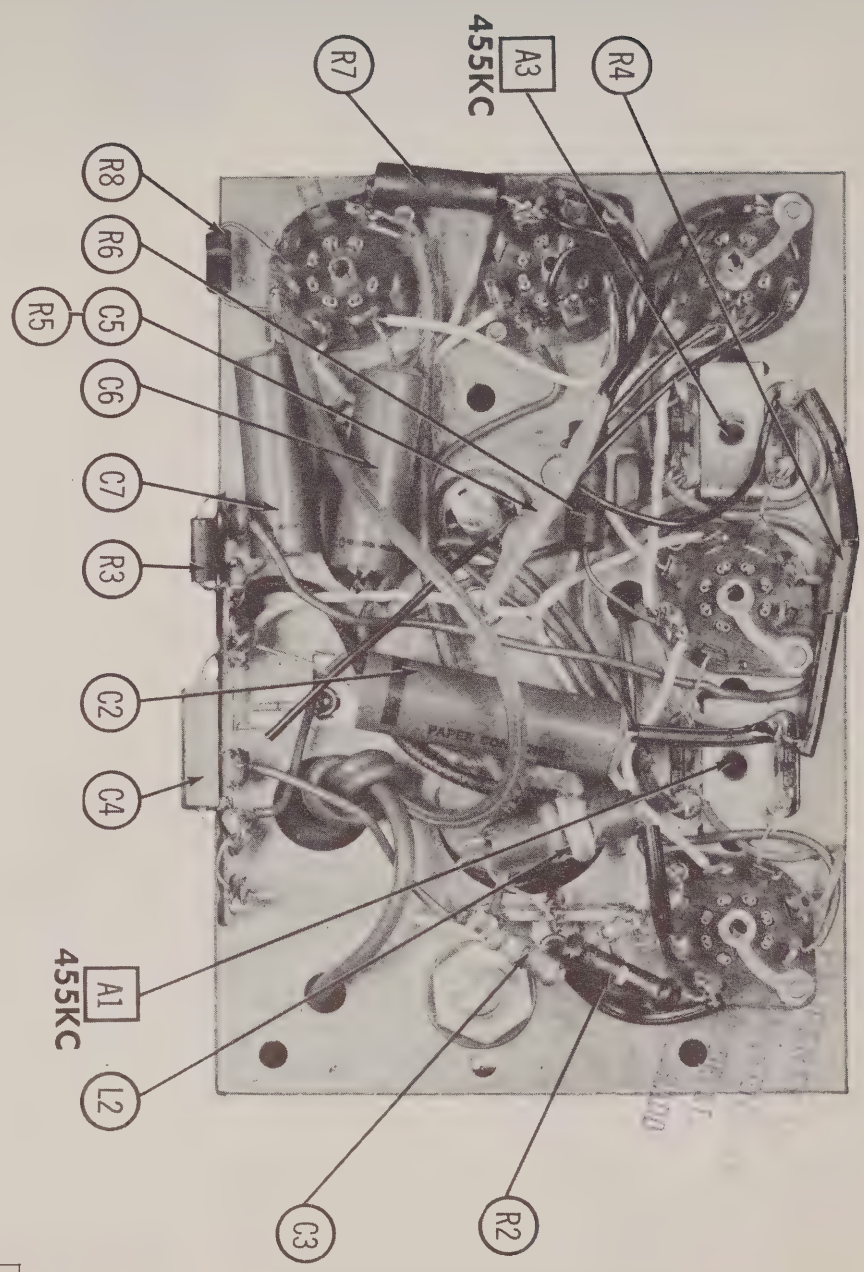
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ROLAND PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	.7Ω					
L2	Osc. Coil	.6Ω	3.2Ω		70-Osc.*	14-1073	
L3	Input IF	20Ω	20Ω		12-C1	16-6758	
L4	Output IF	20Ω	20Ω		12-C2	16-6758	

* Do not use tap on secondary winding.

MISCELLANEOUS

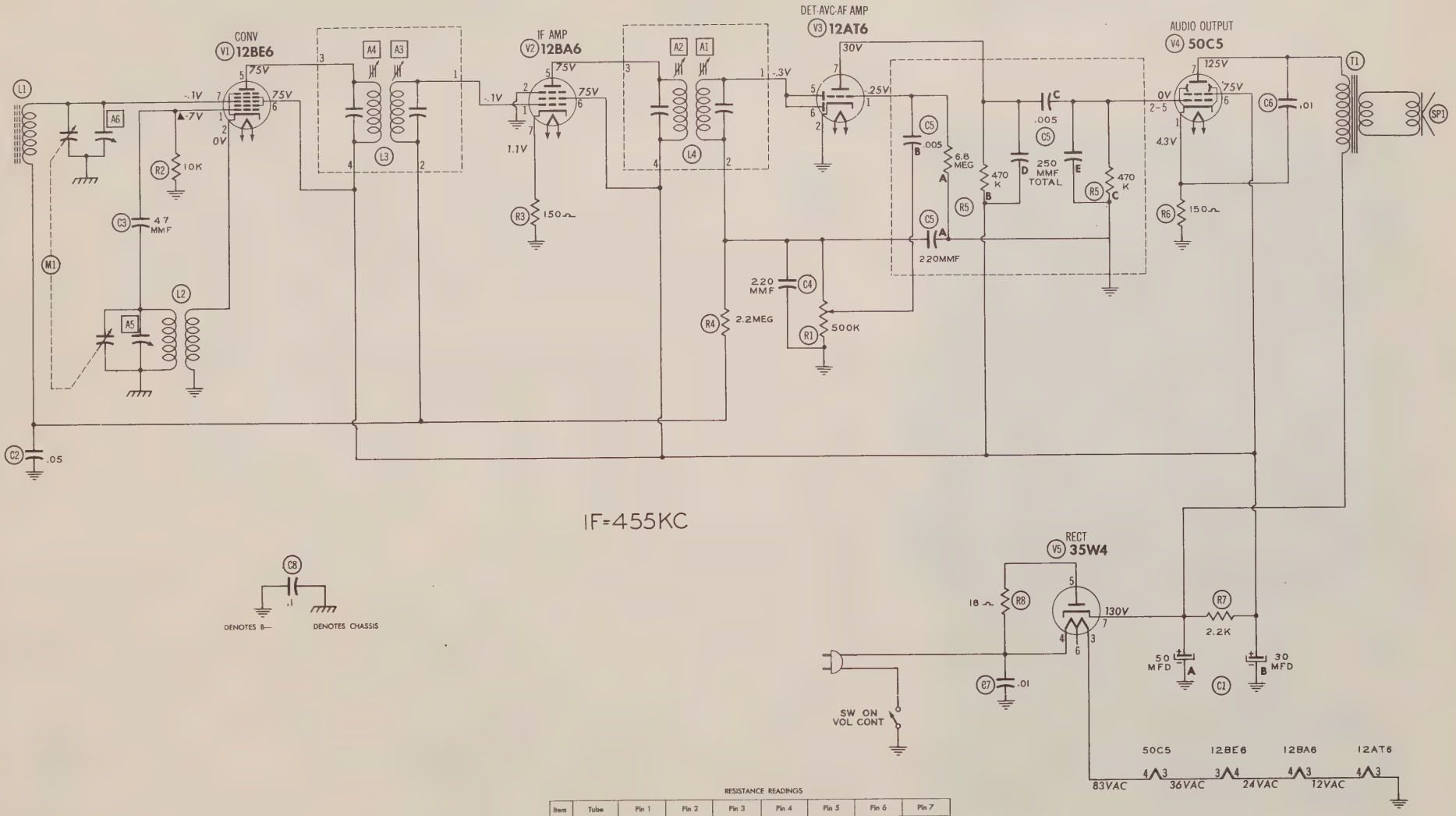
ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Tuning Capacitor		(45-462MMF, 36-195MMF)

CHASSIS—BOTTOM VIEW



ROLAND MODEL 5TIE

ROLAND MODEL 5TIE



IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	10KΩ	.6Ω	36Ω	24Ω	†2.2KΩ	†2.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	150Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†2.2KΩ	†138Ω
V 5	35W4	INF	150Ω	85Ω	120Ω	138Ω	112Ω	130KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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205-8

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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MODEL 1U462

SENTINEL MODELS
1U462, 1U463, 462, 463 (Ch. 2WA)

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DATE 6–53 SET 205 FOLDER 9

SENTINEL MODELS
1U462, 1U463, 462, 463 (Ch. 2WA)

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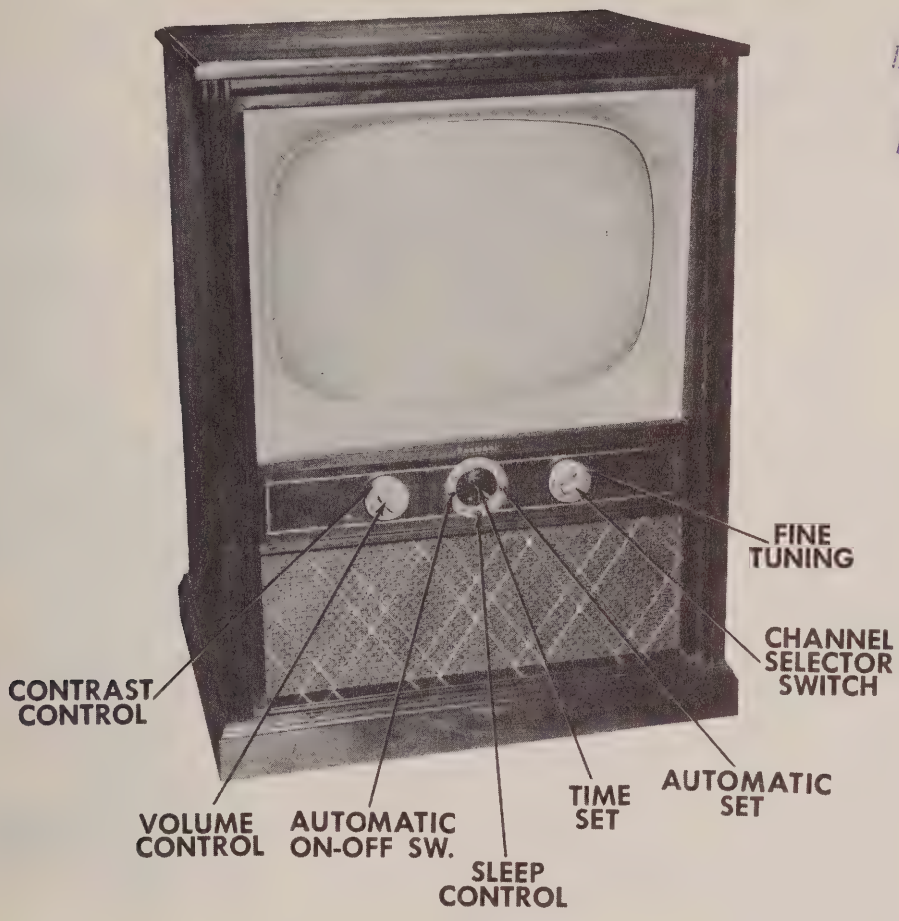
[illegible] ST.
DENVER, COLORADO



SENTINEL MODELS
1U462, 1U463, 462, 463 (Ch. 2WA)

SENTINEL MODEL 1U462

TRADE NAME	Sentinel Models 1U462, 1U463, 462, 463 (Ch. 2WA).
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-One

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.1 Amp @ 117 Volts AC
TUNING RANGE–Channels 2 thru 13, Video IF 26.4MC, Sound IF 21.9MC (Intercarrier).

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 19
Horizontal Sweep Circuit Adjustments 13
Parts List And Descriptions 14, 15, 16
Photographs
- Cabinet-Rear View 13
- Capacitor and Alignment Identification 4, 9
- Chassis-Top View 3
- RF Tuner 10
- Resistor and Inductor Identification 11, 18

Resistance Measurements 8
Servicing in the Field 19
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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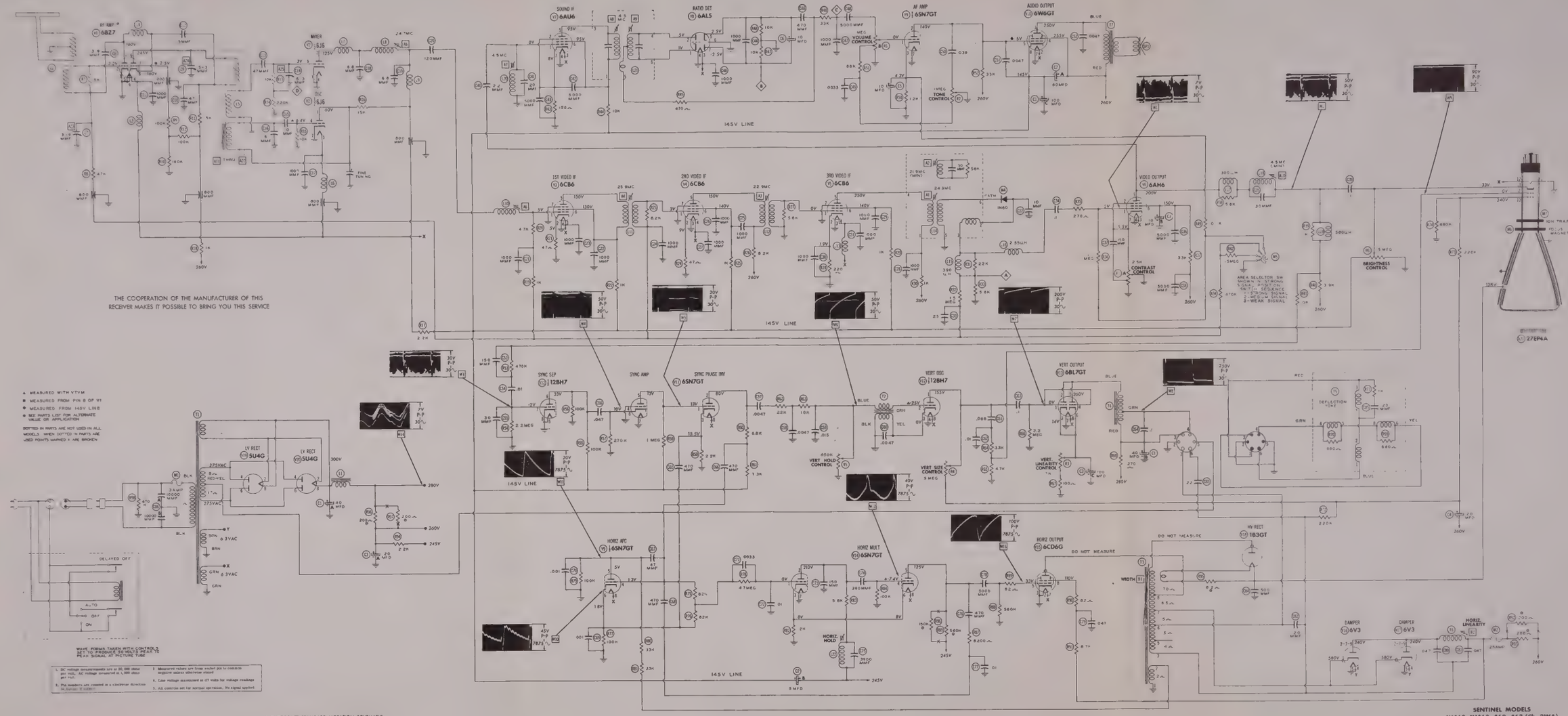
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SOUND IF V7 6AU6
RATIO DET V8 6AL5
AF AMP V9 6SN7GT
AUDIO OUTPUT V10 6W6GT
1ST VIDEO IF V1 6CB6
2ND VIDEO IF V2 6CB6
3RD VIDEO IF V3 6CB6
VIDEO OUTPUT V6 6AH6
RF AMP V1 6BZ7
MIXER V2 6J6
OSC V3 6J6
145V LINE
SYNC SEP V12 12BH7
SYNC AMP
SYNC PHASE INV V7 6SN7GT
VERT OSC V12 12BH7
VERT OUTPUT V13 6BL7GT
HORIZ AFC V9 6SN7GT
HORIZ MULT V14 6SN7GT
HORIZ OUTPUT V15 6CD6G
HV RECT V16 1B3GT
DAMPER V16 6V3
DAMPER V17 6V3
LV RECT V19 5U4G
LV RECT V20 5U4G
27EP4A
VOLUME CONTROL
TONE CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
VERT HOLD CONTROL
VERT SIZE CONTROL
VERT LINEARITY CONTROL
HORIZ HOLD
HORIZ LINEARITY
WIDTH
ION TRAP
FOCUS MAGNET
DEFLECTION YOKE
DO NOT MEASURE
A MEASURED WITH VTVM
B MEASURED FROM PIN 8 OF V1
C MEASURED FROM 145V LINE
D SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS P-P AT TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted as a clockwise direction as viewed in socket.
3. Measured values are from socket pin to common negative source (electron mixed)
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation. No signal applied.
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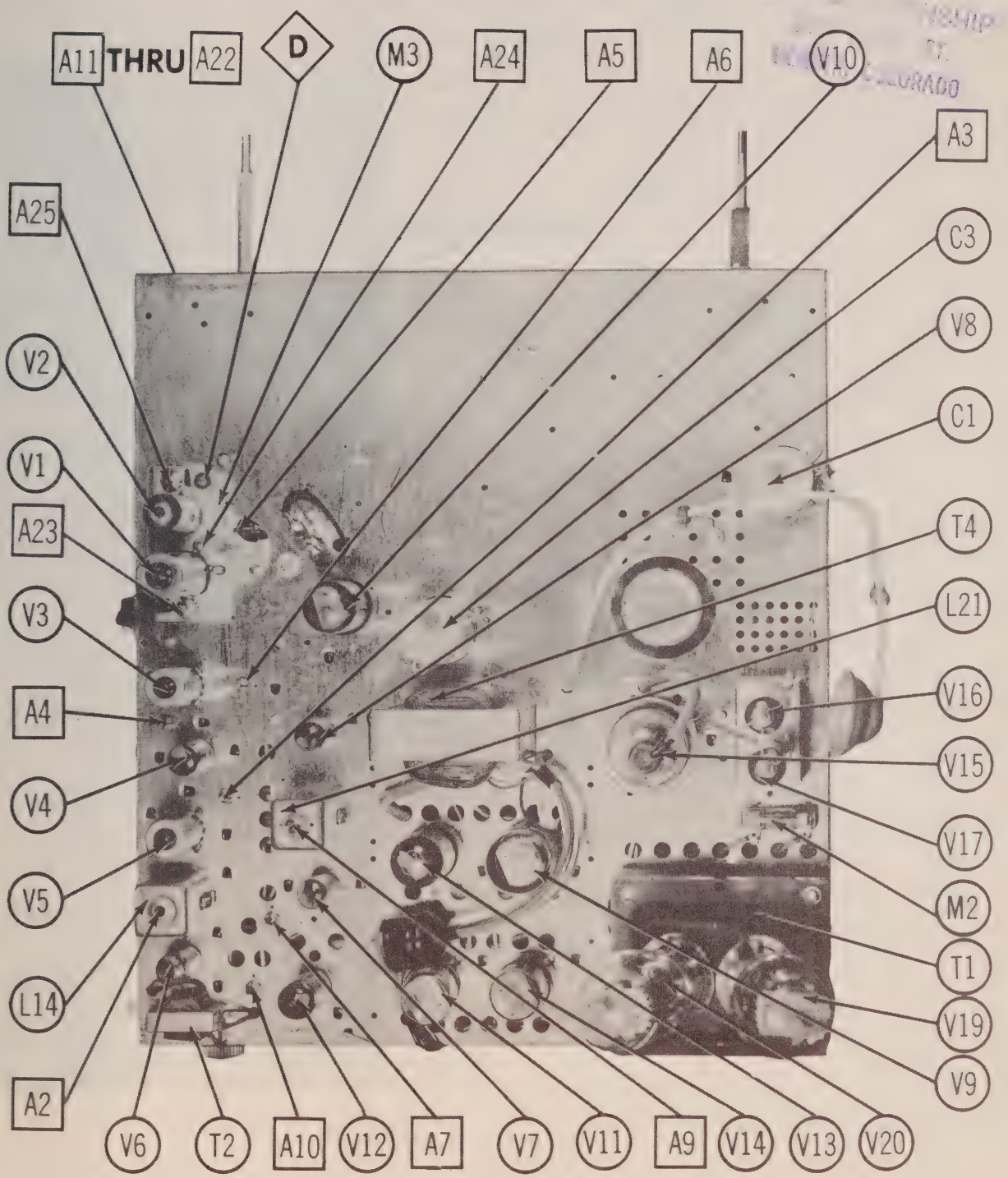
SENTINEL MODELS
1U462, 1U463, 462, 463 (Ch. 2WA)



CHASSIS TOP VIEW

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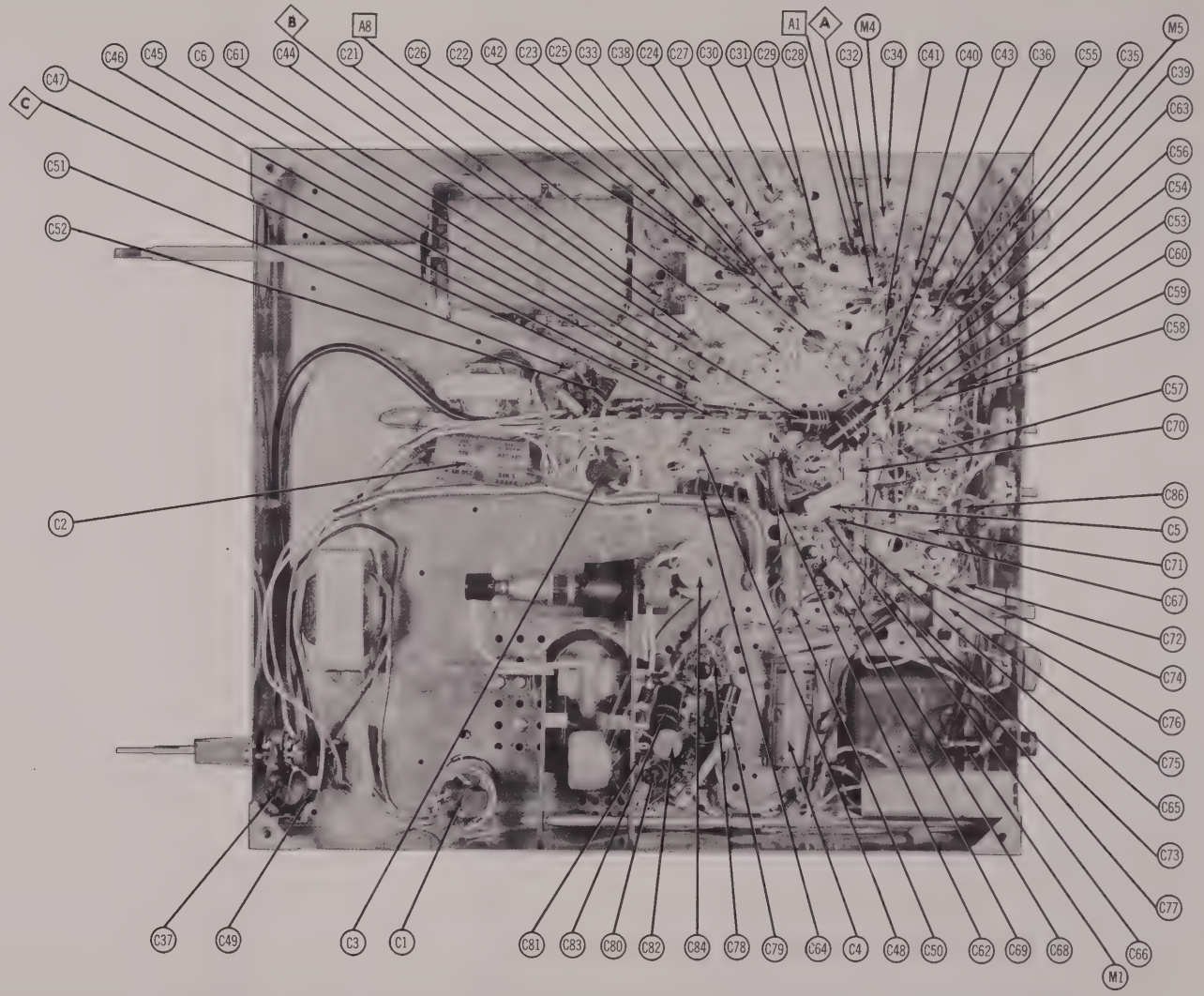
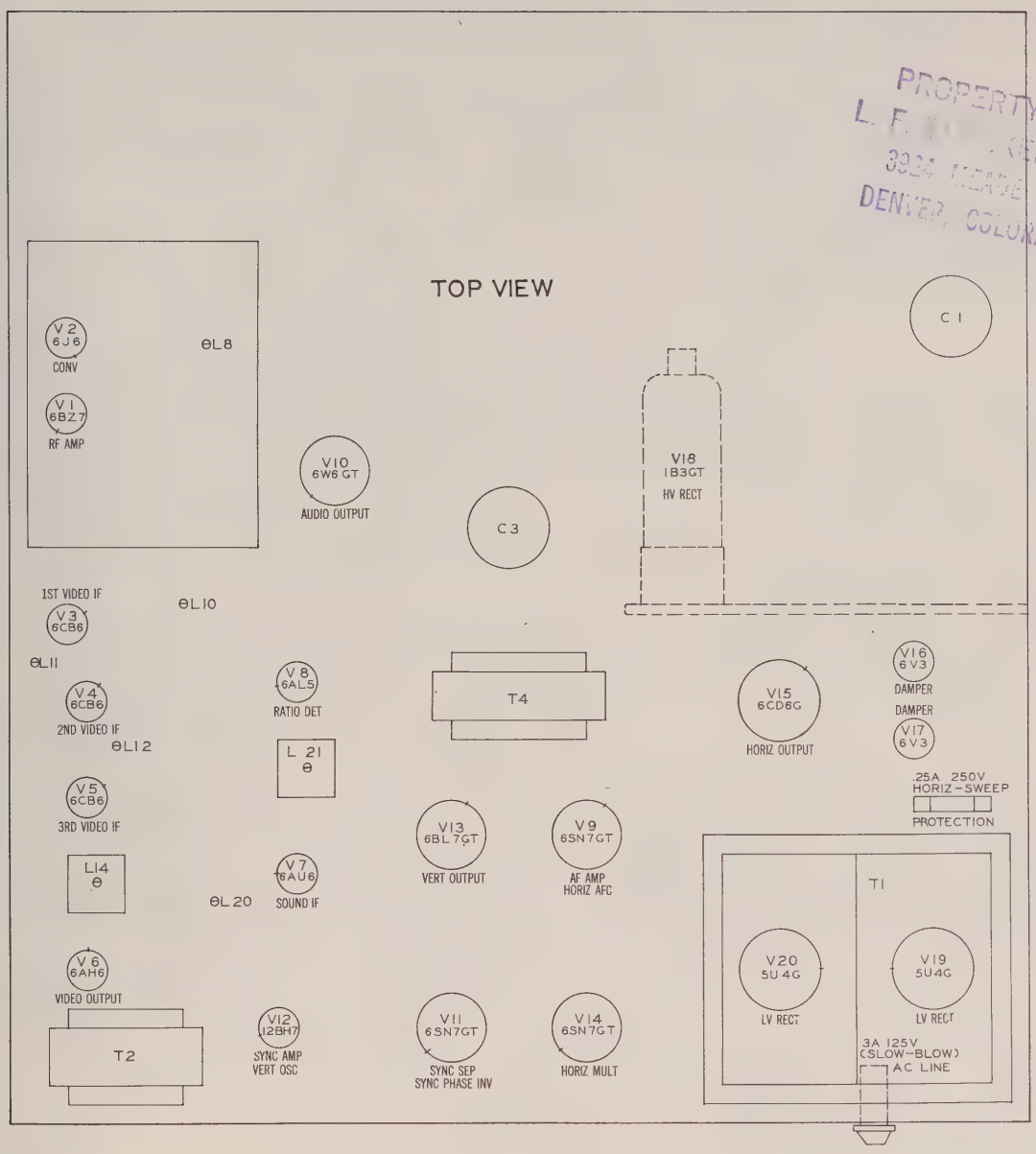


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V19, V20 Fuse M1

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6, V10
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V21
Has pic, no sound-V7, V8, V9, V10

SYNC FAILURE
No vert. sync.-V11, V12
No horiz. sync.-V9, V11, V13
No vert. or horiz. sync.-V11, V12

SWEEP FAILURE
No raster, has sound-V14, V15, V16, V17, V18, V21 Fuse M2
No vertical deflection.- V12, V13
Poor vert. linearity or foldover-V12, V13
Poor horiz. linearity or foldover-V14, V15, V16, V17
Narrow picture-V14, V15, V16, V17, V18, V19 , V20
Vert. off freq.-V11, V12
Horiz. off freq.-V9, V11, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.
Set locality switch to "Strong Signal" position during alignment.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded end of C33. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.3MC	Any	DC probe thru 47KΩ to point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	21.9MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	22.9MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	25.9MC	"	"	A4	"
5.	"	"	24.7MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.9MC 23MC 26.4MC	Any	Vert. amp thru 47KΩ to point (A) Low side to chassis.	A6	Adjust so that 26.4MC is at 60% response as in Fig. 1. Check for response as in Fig. 1, and if necessary retouch A1, A3, A4 and A5.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6, V5, from its socket.
Set contrast control for maximum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point (B) Common to chassis.	A7, A8	Adjust for maximum deflection. Attenuate generator output for less than 10 Volts at VTVM.
8.	"	"	"	"	DC probe thru 47KΩ to point (C) Common to chassis.	A9	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6, V5, from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Set contrast control for maximum contrast.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp thru 47KΩ to point (B) Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
8.	"	"	"	"	"	Vert. amp thru 47KΩ to point (C) Low side to chassis.	A9	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of cross-over lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to pin 11 (cathode of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point (B) Common to chassis.	A10	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. Replace 6CB6, V5, if not already replaced.
Connect bias battery as under Video IF Alignment.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp thru 47KΩ to point (A) Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 60% response.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be performed unless it is absolutely necessary.

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp to point Ⓓ. Low side to chassis.	A23, A24, A25	Adjust for response curve similar to Fig. 5.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make compromise adjustments of A23, A24 and A25 with channel switch set to that channel then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

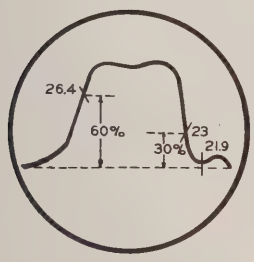


FIG.1

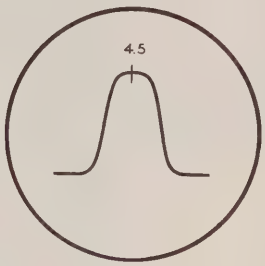


FIG. 2

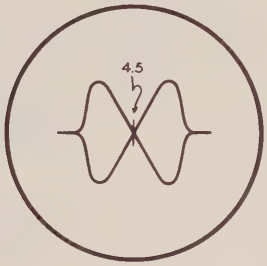


FIG.3

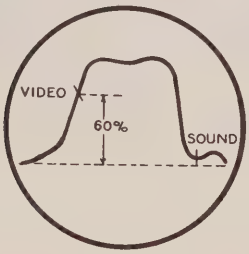


FIG. 4

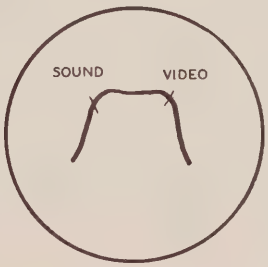
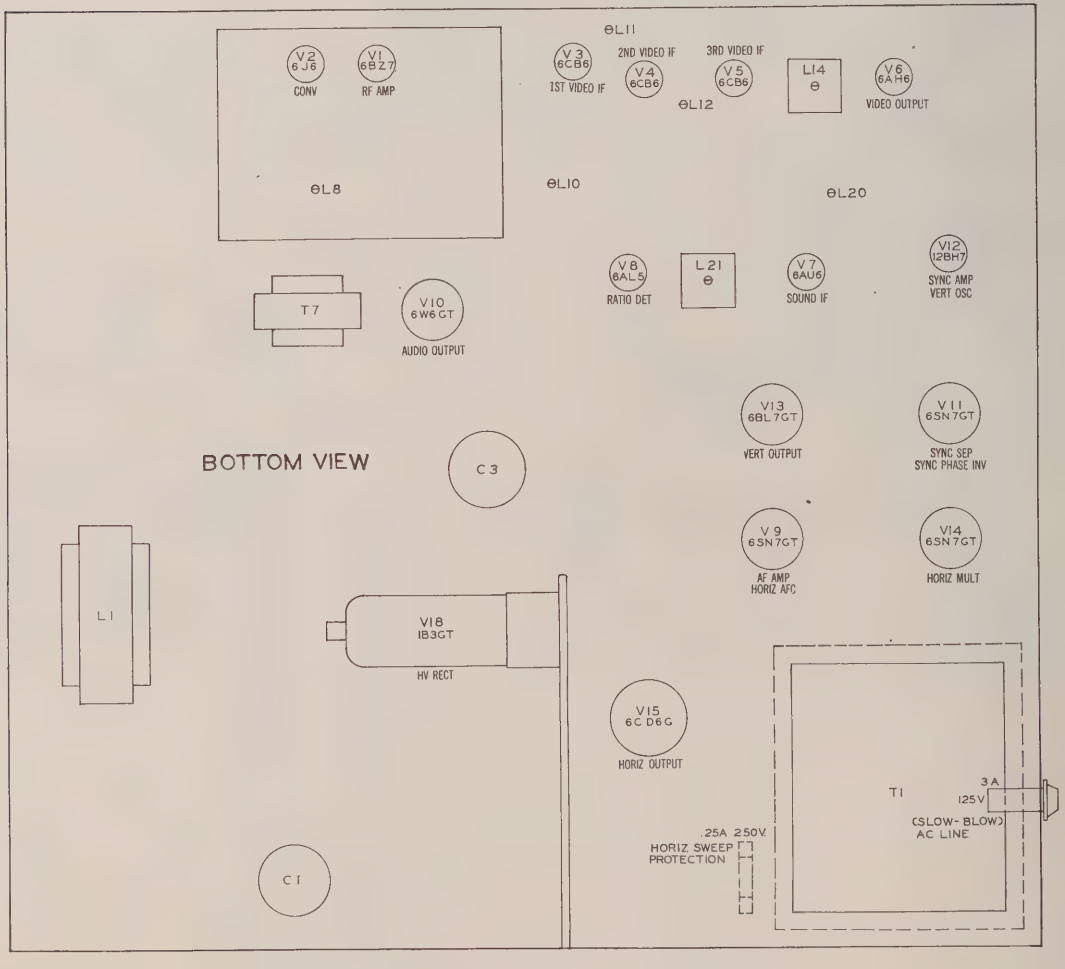


FIG. 6

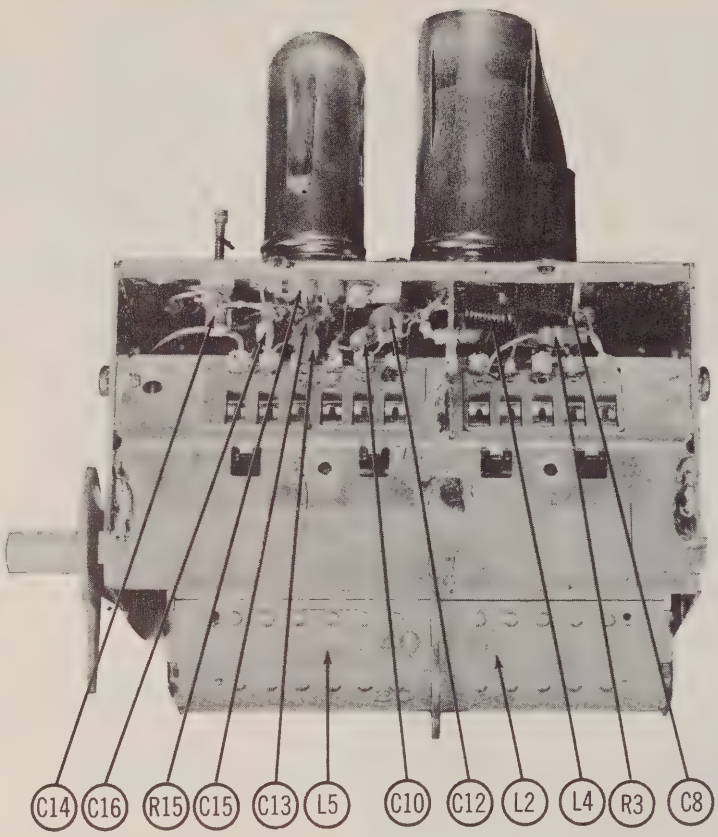
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	1.5Meg	0Ω	.1Ω	0Ω	†2.7KΩ	†170KΩ	INF	0Ω
V 2	6J6	17KΩ	♯2.2KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	1.5Meg	47Ω	.1Ω	0Ω	♯1KΩ	♯1KΩ	0Ω		
V 4	6CB6	1.5Meg	47Ω	0Ω	.1Ω	†8.4KΩ	♯1KΩ	0Ω		
V 5	6CB6	.2Ω	220Ω	0Ω	.1Ω	†1.2KΩ	♯1KΩ	0Ω		
V 6	6AH6	1.1Meg	400Ω	.1Ω	0Ω	†4.1KΩ	†33KΩ	400Ω		
V 7	6AU6	3.4Ω	150Ω	.1Ω	0Ω	♯10KΩ	♯10KΩ	150Ω		
V 8	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 9	6SN7GT	50Ω	†33KΩ	1.2KΩ	265KΩ	40KΩ	100KΩ	0Ω	.1Ω	
V 10	6W6GT	INF	.1Ω	†375Ω	†173Ω	†33KΩ	INF	0Ω	160KΩ	
V 11	6SN7GT	♯1 Meg	♯10KΩ	2.2KΩ	0Ω	♯1 Meg	270KΩ	0Ω	.1Ω	
V 12	12BH7	#2.7Meg	650KΩ	50Ω	0Ω	0Ω	♯70KΩ	2.2Meg	0Ω	.1Ω
V 13	6BL7GT	2.2Meg	†630Ω	550Ω	2.2Meg	†630Ω	550Ω	0Ω	.1Ω	
V 14	6SN7GT	4.9Meg	†8KΩ	1.2KΩ	100KΩ	†280KΩ	1.2KΩ	0Ω	.1Ω	
V 15	6CD6G	#5Ω	0Ω	0Ω	560KΩ	560KΩ	†280KΩ	.1Ω	†9KΩ	Top Cap #6.5Ω
V 16	6V3	INF	†283Ω	INF	.1Ω	0Ω	INF	†283Ω	INF	Pin 9 †283Ω / Top Cap 1 Meg
V 17	6V3	INF	†283Ω	INF	.1Ω	0Ω	INF	†283Ω	INF	Pin 9 †283Ω / Top Cap 1 Meg
V 18	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #177Ω
V 19	5U4G	INF	200KΩ	INF	17.5Ω	INF	16.4Ω	INF	200KΩ	
V 20	5U4G	INF	200KΩ	INF	17.5Ω	INF	16.4Ω	INF	200KΩ	
V 21	27EP4	0Ω	4.7KΩ	Pin 10 †9KΩ	Pin 11 450KΩ	Pin 12 .1Ω				

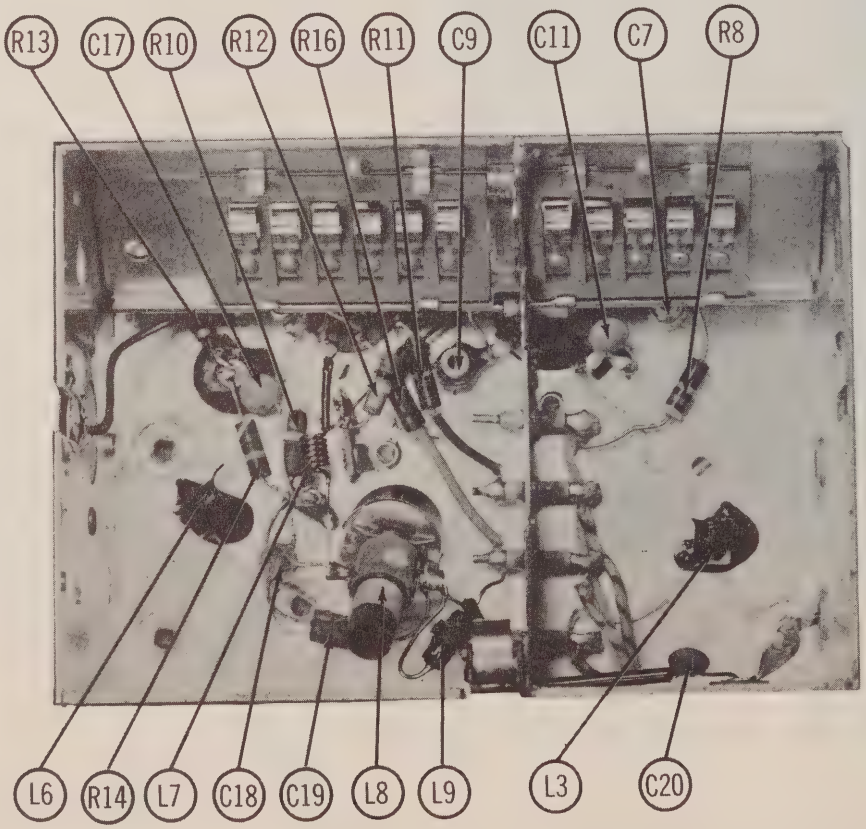
ALL MEASUREMENTS TAKEN WITH AREA SELECTOR SWITCH IN STRONG SIGNAL POSITION.
† MEASURED FROM PIN 8 OF V19 AND V20.
♯ MEASURED FROM 145 VOLT LINE.
MEASURED FROM TOP CAP, V16.



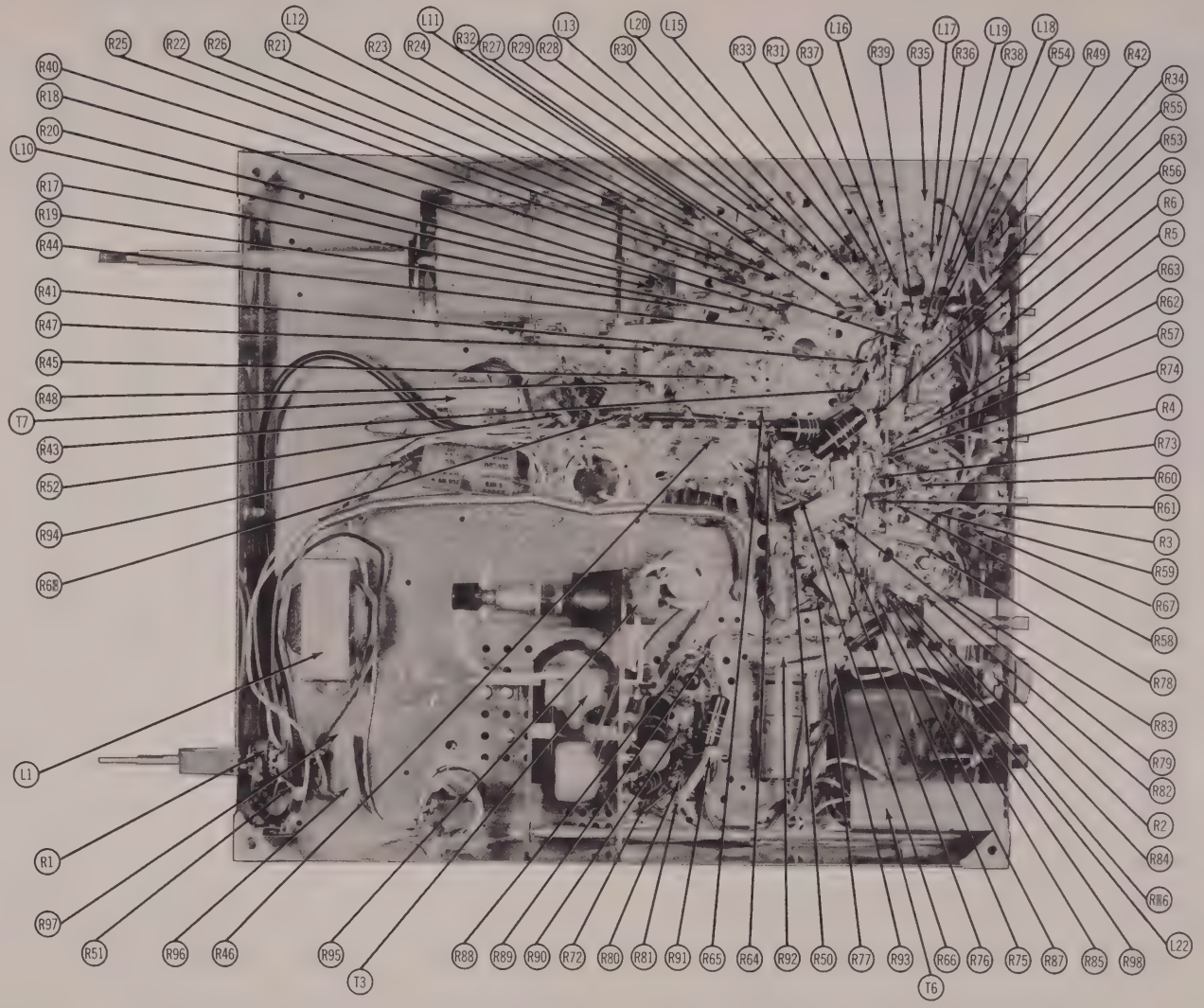
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See LOSS OF HIGH VOLTAGE

INSUFFICIENT SWEEP

If Unsatisfactory	If Satisfactory
Check components of horizontal oscillator and coupling network between V14 and V15.	Check components of horizontal output and damper tubes, particularly T3 and T5A. Check C79 for open.

DRIVE LINES

Substitute V15 and check coupling and waveshaping components between V14 and V15.

COMPRESSED AT LEFT SIDE

Substitute V15, V16 and V17. Check T3, T5A, T6 and associated components.

FOLDS

Substitute V16 and V17. Check T3, T5A and associated components.

XMAS TREE EFFECT

Substitute V14. Check C75 and L22.

VERTICAL

LOSS OF SWEEP

Substitute V12 and V13. Check waveform W7.

If Unsatisfactory	If Satisfactory
Check components of V12, especially C57 and T2.	Check components of V13, particularly T4 and T5B.

INSUFFICIENT SWEEP

Follow procedure outlined under LOSS OF SWEEP

COMPRESSED AT BOTTOM

If adjustment of height and vertical linearity controls do not correct this, substitute V13 and check C63 for leaky condition and C3C for open.

COMPRESSED AT TOP, STRETCHED AT BOTTOM

Check adjustment of height and vertical linearity controls. Check C61 and C62 for open or change in value.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V11, V12, V9 and V14. Check waveform W11.

If Unsatisfactory	If Satisfactory
Check waveform W4.	Substitute V14 and check associated components.

Check waveform W4.

If Unsatisfactory	If Satisfactory
Check waveform W3.	Substitute V9 and V11. Check components of V9B and V11.

Check waveform W3.

If Unsatisfactory	If Satisfactory
Check coupling network between V6 and V12.	Substitute V12 and check associated components.

CRITICAL HOLD

Substitute V9, V11, V12 and V14. If no change is noted, follow procedure outlined under LOSS OF SYNC.

PULLING PICTURE

Substitute V9 and V14. Check associated components.

VERTICAL

LOSS OF SYNC

Substitute V11, V12 and V13. Check associated components, particularly C57 and T2.

CRITICAL SYNC

Substitute V12 and check coupling network between V12 and V13.

TRIGGERING

Dress filament leads away from vertical oscillator grid leads.

VIDEO

SOUND BARS

Check adjustment of A10 (4.5MC Trap) in video output grid circuit. Check local oscillator adjustment and video IF alignment.

POOR RESOLUTION

Check alignment of video IF. If alignment cannot be brought within tolerance, substitute video IF tubes and check circuit components.

SMEAR

Check R37 for change in value. Check L17 for open. Check coupling circuits between the detector and the video output tube and between the video output tube and the picture tube. Check video IF and video detector for overloading.

ONE WIDE BLACK BAR ACROSS PICTURE

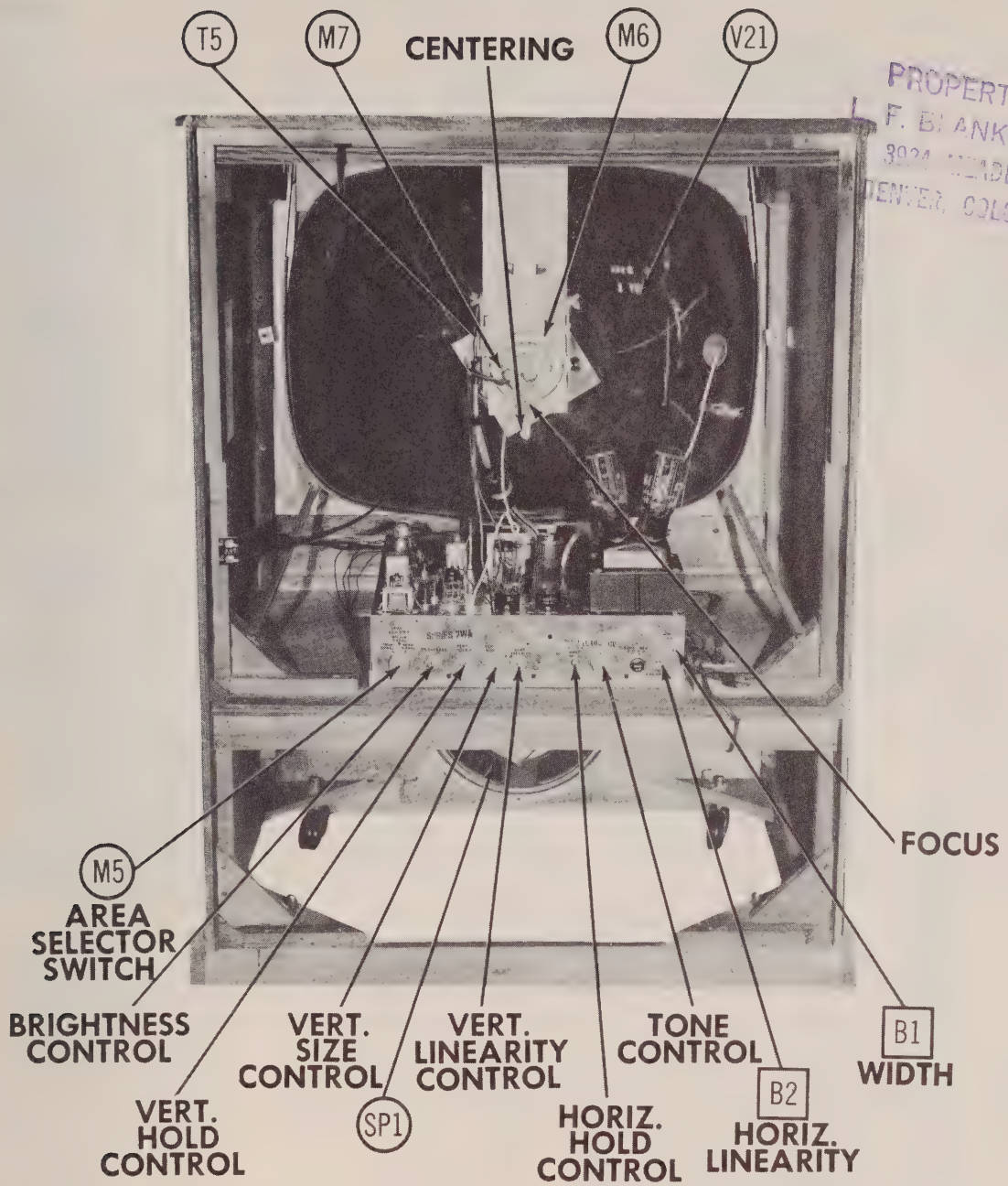
Check tuner, video IF, video amplifier and picture tubes for filament to cathode leakage.

POOR CONTRAST

Check waveform W1.

If Insufficient	If Sufficient
Check by substitution tuner and video IF tubes. Substitute video detector (the 1N60). Check AGC network. Check video IF alignment.	Substitute V6 and check associated components as well as the coupling network between V6 and the picture tube. Substitute the picture tube.

PROPERTY OF
F. BLANKEN
3924 MEADE S
DENVER, COLORA



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold to synchronize the picture horizontally.

Adjust the width slug (B1) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B2) for a picture that is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BZ7	6BZ7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	8AJ	
V2	Converter	6J8	6J8	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AH6	6AH6	7BK	
V7	Sound IF Amp.	6AU8	6AU8	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier - Horiz. AFC	6SN7GT	6SN7GT	8BD	
V10	Audio Output	6W6GT	6W6GT	7S	
V11	Sync Amplifier- Sync Phase Inv. Sync Separator- Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V12		12BH7	12BH7	9A	
V13	Vert. Output	6BL7GT	6BL7GT	9BD	
V14	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6CD6G	6CD6G	5BT	
V16	Damper	6V3	6V3	9BD	
V17	Damper	6V3	6V3	9BD	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SENTINEL PART No.	SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21	27EP4	27GP4 ①	12D	① None aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	+40	350	25E65	AFH3-159		C1I8		FP375	TVL-3764	
B	+40	350								
C	+100	200								
C2A	60	250	25E62	FPR450/50		BR1025		TC66	R1291	Red Plain
B	5	250		FPR3250/6		BR425		TC50K		
C3A	+20	350	25E71	AFH4-83		DO62		FP432.9	TVL-3817	
B	+10	350								
C	+100	50								
C4	20	450	25E64	FPR450/20		BR2045A		TC75	TVA-1709	
C5	10	50	25E66	FPR550/10		BR105		TC32	TVA-1304	
C6	10	50	25E67	FPR550/10		BR105		TC32	TVA-1304	
C7	3-9		31A-079		829-10					
C8	3.9		CD8C030C				CT5S5A			
C9	.5-3		31A-069		829-3		CT5S5A			
C10	47		CD8Q470K	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C11	1000		CD8Y102	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C12	1.5		CD8C1R5M	SIL 5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCC-P-V15	
C13	47		CD8Q470K	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C14	.5-3		31A-069		829-3		CT5S5A			
C15	10		CD8C100K	SIL0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C16	5		CD8U050C	SI5N750	TCN-5		N750K-050	NT-555	5TCUB-V5	
C17	1000		CD8Y102Z	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C18	6.8		CD8C5R8C	SIL 5NP0	TCZ-5.6		NP0K-5R6	ZT-5568	5TCCB-V5R	
C19	68	500	13B-052	1469-000007		5R5Q7			MS-47	
C20	120		13B-055	SIL20	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C21	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C22	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C23	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C24	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C25	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C26	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C27	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C28	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C29	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C30	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C31	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C32	10		23E25	SI0N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C33	.25	100	23E122	P488-25		PT3P2S		PT402S	2TM-P2S	
C34	.1	200	23E3216	P388-1	DF-104	PT3P1		PT401	2TM-P1	
C35	30		23E23		TCZ-30		NP0L-300			
C36	5000		23E2025	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C37	150		23E2027-10	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C38	5000		23E2025	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C39	.1	400	23E3416	P489-1	DF-104	PTE4P1		PT401	4TM-P1	
C40	2.2		23E21		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C41	20		23E22	SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C42	5000		23E2025	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C43	5000		23E2025	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C44	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C45	470	500	23E3500-40	1469-0005		5R5T5		MCB245	MS-35	
C46	1000		23E2025-3	BPD-001	DD-102	TM5DI	801-001	DC-521	5HK-DI	
C47	1000		23E2027-9	SI1000	D6-102	TM5DI	GP2L-102	UC-521	5HK-DI	
C48	5000		23E23	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C49	.0033	400	23E3407	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C50	.039	400	23E3423	P688-04		PTE6S4		PT6247	6TM-S4	
C51	.0047	400	23E3408	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C52	.0047	600	23E3698	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C53	150		23E2027-10	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C54	.01	400	23E3410	P489-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C55	30		23E23		TCZ-30		NP0L-300			
C56	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C57	.0047	400	23E3408	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C58	.0047	400	23E3408	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C59	.015	400	23E3425	P488-015		PTE6S15		TP490	6TM-S15	
C60	.0047	400	23E3408	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTE
C61	.068	400	23E3415	P488-068		PTE4S68			4TM-S68	
C62	.01	400	23E3424	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C63	.1	400	23E3416	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C64	.1	400	23E3418	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C65	470	500	23E3500-40	1469-0005		5R5T5		MCB245	MS-35	
C66	470	500	23E3500-40	1469-0005		5R5T5		MCB245	MS-35	
C67	47		23E2030-15	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C68	470	500	23E3500-40	1469-0005		5R5T5		MCB245	MS-35	
C69	.001	400	23E3404	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C70	.001	400	23E3404	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C71	.0033	400	23E3407	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C81	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C73	150		23E2027-10	SI150NP0	TCZ-150		NP0-334-151	ZT-5315	5TCC-T15	
C74	390	500	23E3500-39	1469-0004		5R5T4		MCB243	MS-34	
C75	390	500	23E3503-4	1464-004		5DR5D4		MCE453	MS-24	
C76	470	500	23E3500-40	1469-0005		5R5T5		MCB245	MS-35	
C77	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C78	.039		23E2025	BPD-005	MD-502	TM5D5	81L-005	DC-525	5HK-D5	
C79	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C80	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C81	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C82	120	4000	23E2025-7							
C83	.22	400	23E3418	P488-22		PTE4P23		PT4025	4TM-P22	
C84	500	30000	23E2035-3							
C85	120	2000	23E2025-7							
C86A	10000		23E2037-6	BPD-2X01	DD-3-103	TM5D51	81J-01	DC-511	5HK-2S1	
B	10000						81J-01	DC-511		

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω	½	28E95	QJ-463*				Contrast-Tap⑥ 1400Ω-Panel
B	1 Meg	½						Volume-Tap⑥ 350KΩ-Rear
R2A	1 Meg	½	28E96	QU-137	AG-61-8	AB-69	SU-54	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	2000Ω	½	28E97	QU-110	AG-11-8	AK-6	U-6	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	5 Meg with 1Meg stop	½	28E88	QU-141*	AG-65-8 *	AB-87*	SU-67*	Vert. Size*
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	850KΩ with 350KΩ stop	½	28E90	QU-133†	AB-58-8†	AB-58†	SU-54†	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5 Meg with 100KΩ stop	½	28E87	QU-141**	AG-65-8**	AB-87**	SU-67**	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

* Connect a 1Meg resistor in series with center terminal.
† Connect a 330KΩ resistor in series with center terminal.
** Connect a 100KΩ resistor in series with clockwise terminal and ground.
■ CONCENTRIKIT EQUIVALENT- KIT K-2, BASE ELEMENTS & SHAFTS B27-11JX & P6-218 (Panel), B13-137X & R9-314 (Rear).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	SENTINEL PART No.	IRC PART No.	NOTES
R7	15KΩ	½	27E153-2	BTS-15K	
R8	47KΩ	½	27E473-2		
R9	100KΩ	½	27E1009-27	BTS-100K	
R10	160KΩ-5%	½	27E1009-12	BTS-160K-5%	
R11	1500Ω	½	27E152-2	BTS-1500	
R12	100KΩ-5%	½	27E1009-27	BTS-100K-5%	
R13	10KΩ	½	27E103-2		
R14	220KΩ	½	27E224-2		
R15	10KΩ	½	27E103-2		
R16	15KΩ	½	27E153-2	BTS-15K	
R17	2200Ω	½	27E222-2	BTS-2200	
R18	1000Ω	½	27E102-2	BTS-1000	
R19	1000Ω	½	27E102-2	BTS-1000	
R20	4700Ω-5%	½	27E1009-26	BTS-4700-5%	
R21	47Ω	½	27E470-2	BTS-47	
R22	1000Ω	½	27E102-2	BTS-1000	
R23	8200Ω-5%	½	27E1009-22	BTS-8200-5%	
R24	47Ω	½	27E470-2	BTS-47	
R25	4700Ω	½	27E102-2	BTS-1000	
R26	8200Ω	½	27E822-2	BTA-8200	
R27	56000-5%	½	27E1009-8		
R28	220Ω	½	27E221-2	BTS-220	
R29	1000Ω	½	27E102-2	BTS-1000	
R30	1000Ω	½	27E102-2	BTS-1000	
R31	220Ω	½	27E223-2	BTS-220	
R32	1.5Meg	½	27E155-2	BTS-1.5Meg	
R33	5600Ω-5%	½	27E1009-8	BTS-5600-5%	
R34	470KΩ	½	27E474-2	BTS-470K	
R35	270Ω	½	27E271-2	BTS-270	
R36	1 Meg	½	27E105-2	BTS-1 Meg	
R37	33KΩ	½	27E333-2	BTA-33K	
R38	5600Ω-5%	½	27E1009-8	BTS-5600-5%	
R39	1000Ω	½	27E102-2	BTS-1000	
R40	3900Ω-5%	½	27E1009-48	BTS-3900-5%	
R41	10KΩ	½	27E103-2	BTS-10K	
R42	1.5Meg	½	27E155-2	BTS-1.5Meg	
R43	150Ω	½	27E151-2	BTS-150	
R44	10KΩ	½	27E103-2		
R45	47KΩ	½	27E473-2	BTS-470	
R46	33KΩ	½	27E333-2	BTS-33K	
R47	10KΩ-5%	½	27E1009-25	BTS-10K-5%	
R49	10KΩ-5%	½	27E1009-25	BTS-10K-5%	

ITEM No.	RATING: OHMS	RATING: WATT	SENTINEL PART No.	IRC PART No.	NOTES
R49	100KΩ	½	27E1009-10	BTS-100K	
R50	1200Ω	½	27E122-2	BTS-1200	
R51	68KΩ	½	27E683-3	BTS-68K	
R52	33KΩ	½	27E333-3	BTA-33K	
R53	470KΩ	½	27E474-2	BTS-470K	
R54	2.2Meg	½	27E225-2	BTS-2.2Meg	
R55	100KΩ	½	27E104-2	BTS-100K	
R56	100KΩ	½	27E104-2	BTS-100K	
R57	270KΩ	½	27E274-2	BTS-270K	
R58	1 Meg	½	27E105-2	BTS-1 Meg	
R59	2200Ω	½	27E222-2	BTS-2200	
R60	6800Ω	½	27E682-2	BTS-6800	
R61	3300Ω	½	27E332-2	BTS-3300	
R62	22KΩ	½	27E223-2	BTS-22K	
R63	10KΩ	½	27E103-2	BTS-10K	
R64	3300Ω	½	27E332-2	BTS-3300	
R65	4700Ω	½	27E472-2	BTS-4700	
R66	2.2Meg	½	27E225-2	BTS-2.2Meg	
R67	100Ω	½	27E101-2	BTS-100	
R68	270Ω	½	27E271-3	BTA-270	
R69	680Ω	½	27E681-2	BTS-680	
R70	680Ω	½	27E681-2	BTS-680	
R71	1000Ω	½	27E102-2	BTS-1000	
R72	220KΩ	½	27E224-2	BTS-220K	
R73	220KΩ	½	27E224-2	BTS-220K	
R74	680KΩ	½	27E684-2	BTS-680K	
R75	82KΩ	½	27E823-2	BTS-82K	
R76	82KΩ	½	27E823-2	BTS-82K	
R77	100KΩ	½	27E1009-10	BTS-100K	
R78	4.7Meg	½	27E475-2	BTS-4.7Meg	
R79	100KΩ	½	27E104-2	BTS-100K	
R80	33KΩ	½	27E333-2	BTS-33K	
R81	33KΩ	½	27E333-2	BTS-33K	
R82	1200Ω	½	27E122-2	BTS-1200	
R83	5600-5%	½	27E1009-8	BTS-5600-5%	
R84	100KΩ	½	27E1009-10	BTS-100K	
R85	560KΩ	½	27E1009-41	BTS-560K	Note 1
R86	150KΩ	½		BTS-150K	Note 1
R87	3300Ω	½	27E332-2	BTS-8200	
R88	560KΩ	½	27E1009-41	BTS-560K	
R89	82Ω	½	27E820-2		
R90	82Ω	½	27E820-2		

ITEM No.	RATING: OHMS	RATING: WATT	SENTINEL PART No.	IRC PART No.	NOTES
R91	8700Ω	5	27E1016-20	1 3/4A-9000	Note 3
R92	2000Ω	5		1 3/4A-300	Note 2
R93	2000Ω	5		1 3/4A-300	Note 2
R94	2200Ω	1	27E222-2	BTS-2200	
R95	6.2Ω	½			Note 3
R96	2000Ω	5		1 3/4A-300	Note 2
R97	2000Ω	5		1 3/4A-300	Note 2
R98	470KΩ	1	27E474-2	BTS-470K	

Note 1. Some models use a single resistor (100KΩ) in this application.
Note 2. Some models use a single resistor (100KΩ-10 Watt) in this application.
Note 3. Part of high voltage socket assembly.

TRANSFORMER (POWER)

ITEM No.	RATING	SENTINEL PART No.	STANCOR PART No.	MERIT PART No	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	PRI. 117VAC @2.1A; SEC. 1: 548VCT @.240ADC; SEC. 2: 5VAC @ 6A; SEC. 3: 6.3VAC @.6A; SEC. 4: 6.3VAC @10.7A	32E82					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	50Ω	210Ω	22E70	A-8125	A-3003	TBO-5	A-97X	20ST2	Vert. Osc. Trans.
T3	190.5Ω tap @ 41Ω, 84Ω, 20.5Ω	2Ω	22E84						Horiz. Output Trans.
T4	290Ω tap @6.5Ω	0Ω	22E81	A-8115①②	A-3038 ②③	TSO-2 ① ②	A-99X ② ③	20ST2-1 2	Vert. Output Trans.
T5A	15Ω		20E814				219D1		Horiz. Deflection Coils
B	43Ω		20E814-2 ④						Vert. Deflection Coils
T6	10Ω		22E820			WC-12 ⑤	213R1		Horiz. Linearity

① Drill new mounting holes.
② Connect as auto transformer.
③ Drill one new mounting hole.
④ Alternate deflection yoke.
⑤ Connect to coded blue & red dot terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI	RATING: DC RES. SEC.	SENTINEL PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T7	2.15KΩ	3.45Ω	200Ω	.8Ω	22E71		A-3876	A-2928	RO-2	S-2X

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C. IMP.	SENTINEL PART No.	VIKING PART No.	QUAM PART No	NOTES
SP1	12"	PM	3.45Ω	1E52-2	12J11	12A31	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ℃/₁	SENTINEL PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No
L1	.240ADC	73Ω	2.97 Hy.	22E83		C-2891	TR-3300 ①	

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	SENTINEL PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L2A	Ant. Coil	0Ω CT 0Ω		31F-522				Channel 2
B	Ant. Coil	0Ω CT 0Ω		31F-523				Channel 3
C	Ant. Coil	0Ω CT 0Ω		31F-524				Channel 4
D	Ant. Coil	0Ω CT 0Ω		31F-525				Channel 5
E	Ant. Coil	0Ω CT 0Ω		31F-526				Channel 6
F	Ant. Coil	0Ω CT 0Ω		31F-527				Channel 7
G	Ant. Coil	0Ω CT 0Ω		31F-528				Channel 8
H	Ant. Coil	0Ω CT 0Ω		31F-529				Channel 9
I	Ant. Coil	0Ω CT 0Ω		31F-530				Channel 10
J	Ant. Coil	0.1Ω CT 0Ω		31F-531				Channel 11
K	Ant. Coil	0Ω CT 0Ω		31F-532				Channel 12
L	Ant. Coil	0Ω CT 0Ω		31F-533				Channel 13
L3	Fil. Choke	0Ω		34A-546				
L4	Neutr. Coil	0Ω		31B-296				
L5A	RF, Mixer Grid & Osc. Coil	0Ω		31F-622				Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		31F-623				Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		31F-624				Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		31F-625				Channel 5

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SENTINEL PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No.	
E	RF, Mixer Grid & Osc. Coil	0Ω		31F-626				Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		31F-627				Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		31F-628				Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		31F-629				Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		31F-630				Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		31F-631				Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		31F-632				Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		31F-633				Channel 13
L6	Fil. Choke	0Ω		34A-575				
L7	RF Choke	0Ω		31B-638				
L8	Conv. Plate	.7Ω		31A-095				
L9	RF Choke	1.2Ω		31B-230				
L10	1st. Video IF	.2Ω		20E780	6171A			
L11	2nd. Video IF	.2Ω	.2Ω	20E779		17-1062		
L12	3rd. Video IF	.2Ω	.2Ω	20E781		17-1063		
L13	Fil. Choke	1.2Ω		2E92	4604		CLA	1.5 Microhenries
L14	4th. Video IF	.4Ω	.8Ω	20E782				Includes trap, 56KΩ resistor & series peaking coil
L15	Shunt Peaking Coil	15Ω		20E363-19	4648	19-1923		390 Microhenries
L16	Series Peaking Coil	1.1Ω		20E834	4606			2.55 Microhenries
L17	Series Peaking Coil	12Ω		20E363-21	4565	19-3300		300 Microhenries
L18	4.5MC Trap	3.4Ω		20E785	1470	20-1004		
L19	Shunt Peaking Coil	18Ω		20E363-20		19-3660		560 Microhenries
L20	Sound IF	3.4Ω		20E785	1469	20-1005		
L21	Ratio Det.	4.2Ω	1Ω CT	20E783	1468	17-1033		Tertiary Winding -.5Ω
L22	Horiz. Osc.	45Ω		20E831	6210	19-1576		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SENTINEL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG (Slo-Blo)	3A 125V	40E8-10	55E57	(3AG 3A Slo-Blo) 313003	342001	MDX-3	HKP
M2	3AG (Slo-Blo)	1/4A 250V	40E8-2	20E584	313.250 (3AG 1/4A Slo-Blo)	357001	MDL 1/4	4406

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M3	RF Tuner	20E787	
M4	Crystal Diode	95E1	Video Detector (1N60)
M5	Switch	29E29	Area Selector
M6	Focus Magnet	62E8	Includes Centering Device
M7	Ion Trap	15E174-7	
	Clock	61E18	Mahogany
	Clock	61E18-2	Blonde
	Crystal (Clock)	P-1024	
	Back (Cabinet)	20E774-4	
	Safety Glass	9E45-5	
	Mask	36E88	
	Knob	37E71-5	Fine Tuning
	Knob	37E71-6	Contrast
	Knob	37E72-11	Channel Selector
	Knob	37E72-15	Off/On Volume
	Knob	37E24-2	Locality Adjuster and Tone (2 Used)
	Knob	P-1020	Clock - Mahogany (3 Used)
	Knob	P-1021	Time Set, Mahogany
	Knob	P-1022	Clock, Green (3 Used)
	Knob	P-1023	Time Set, Green

TROUBLE SHOOTING AIDS (CONT.)

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8, V9 and V10. Check alignment of ratio detector and sound IF stages. Check local oscillator adjustment and video IF alignment.

BUZZ

Adjust ratio detector secondary for minimum buzz. If still noticeable, substitute V8 and readjust. Check adjustment of local oscillator.

DISTORTED

Check audio amplifier stages V9A and V10 using audio signal generator and a scope.

If Undistorted	If Distorted
Check adjustment of ratio detector and sound IF stages. Check video IF alignment.	Substitute tube and check components of stage where distortion occurs.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check 1/4 amp. fuse located behind V16 and V17. Check by substitution V14, V15, V16, V17 and V18. Check for waveform W13.

If Not Present	If Present
Check components of V14, especially C78 for open.	Check T3, T5A, T6 and associated components.

WEAK HIGH VOLTAGE

If substitution of V14, V15, V16, V17 and V18 does not correct trouble, follow procedure outlined under LOSS OF HIGH VOLTAGE.

POWER

SMALL RASTER, WEAK SOUND

Substitute V19 and V20. Check B plus circuit for shorts.

SET DEAD

Check 3 amp. fuse located on rear of chassis. Substitute V19 and V20. Check power transformer and filter components.

DIM RASTER

Substitute V19 and V20. Check B plus circuit for shorts. Check picture tube for low emission.

BLOOMING

Follow procedure outlined under DIM RASTER and under WEAK HIGH VOLTAGE.

GENERAL

HAS RASTER, BUT NO PICTURE OR SOUND

Substitute V2, V5 and V6. Check tuner and Video IF Alignment.

WEAK PICTURE AND SOUND

Substitute V1, V3 and V4. Check associated components.

TOTAL LOSS OF SYNC

Substitute V11 and V12. Check associated components.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

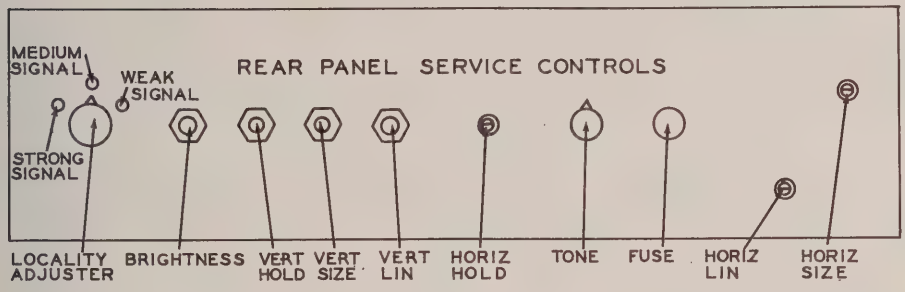
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust the horizontal hold control located on rear of chassis, until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L21) located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 17 wood and 1 metal screw. Remove rear cover.
3. Disconnect built-in antenna. Loosen 2 wood screws. Remove antenna bracket.
4. Disconnect speaker leads, yoke plug, CRT socket, HV lead.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

PHOTOFACT* Folder

*TRADE MARK

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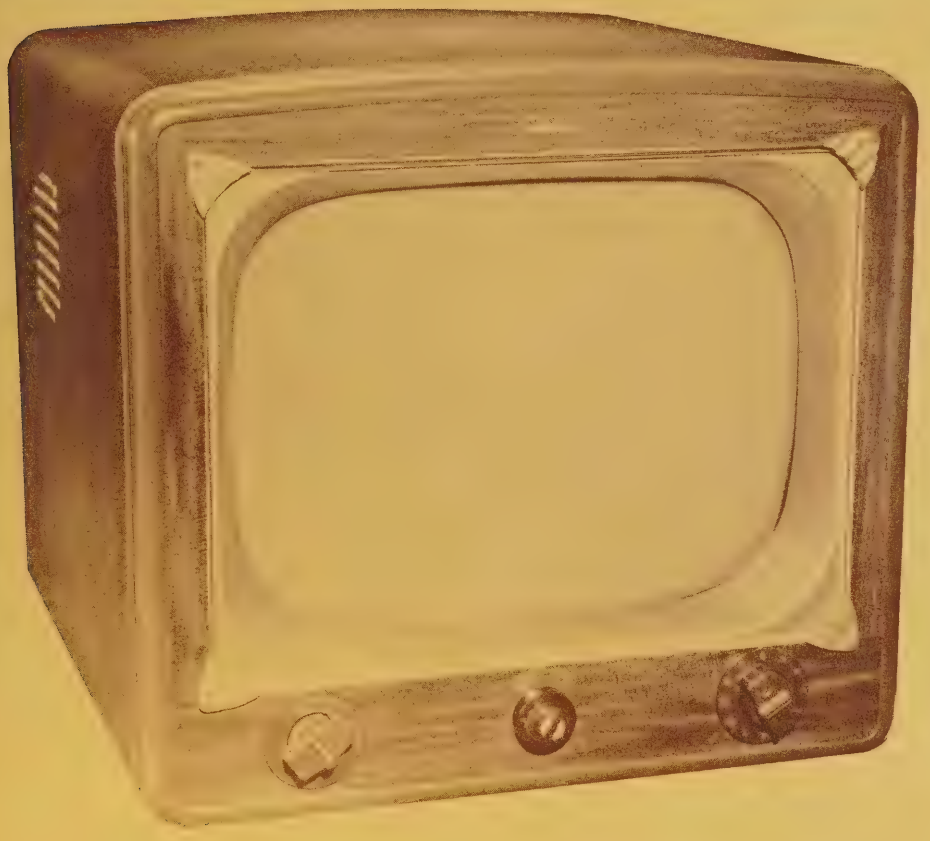

MODEL 1171-10

SILVERTONE MODELS 1161-17 (Ch. 110.702-10), 1171-17 (Ch. 110.702-10, -50)

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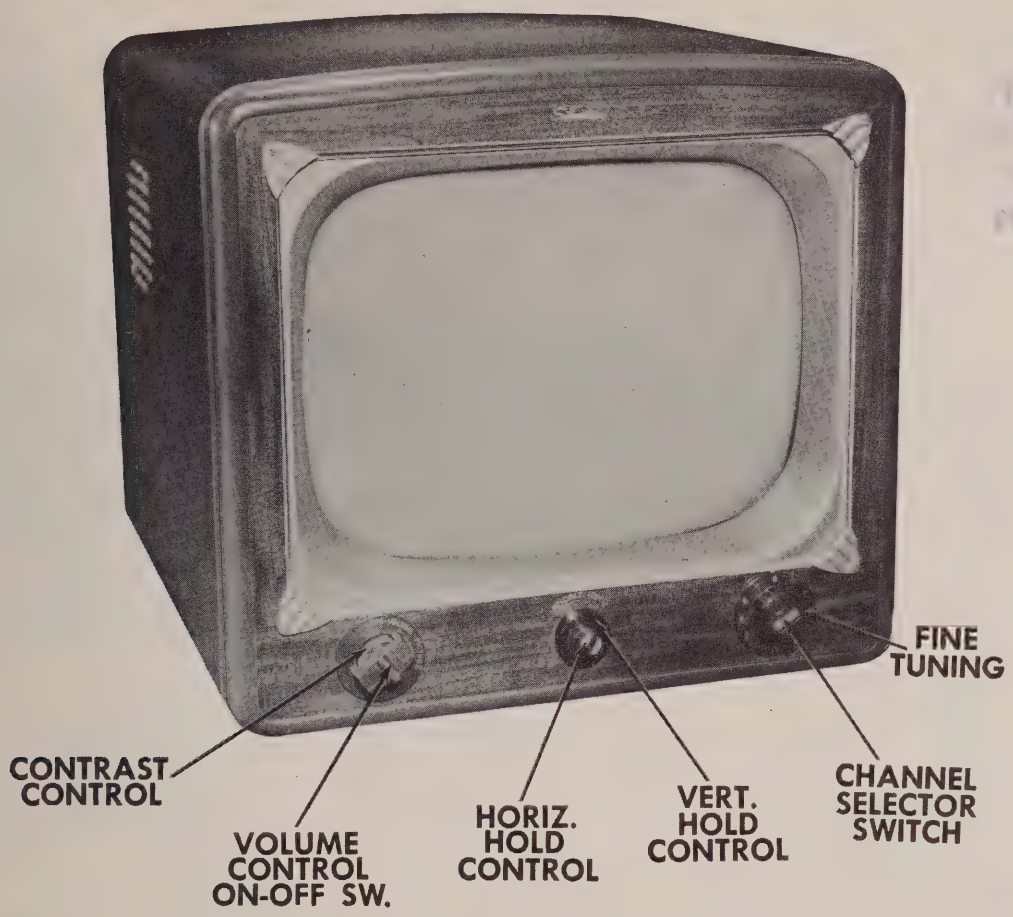
DATE 6–53 SET 205 FOLDER 10



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SILVERTONE MODEL 1171-17 (Ch. 110.702-10)

TRADE NAME	Silvertone Models 1161-17 (Ch. 110.702-10) 1171-17 (Ch. 110.702-10, -50)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.34 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.7 MC, Sound IF 21.2 MC (Intercarrier)

INDEX

Alignment Lnstructions 6, 7
Disassembly Instructions 16
Horizontal Sweep Circuit Adjustment 13
Parts List and Discriptions 14, 15
Photographs
Cabinet-Rear View 13
Capacitor and Alignment Identification 4, 9
Chassis-Top View 3
RF Tuner 10
Photos (cont.)
Resistor and Inductor Identification 11, 18
Resistance Measurements 8
Servicing in the Field 16
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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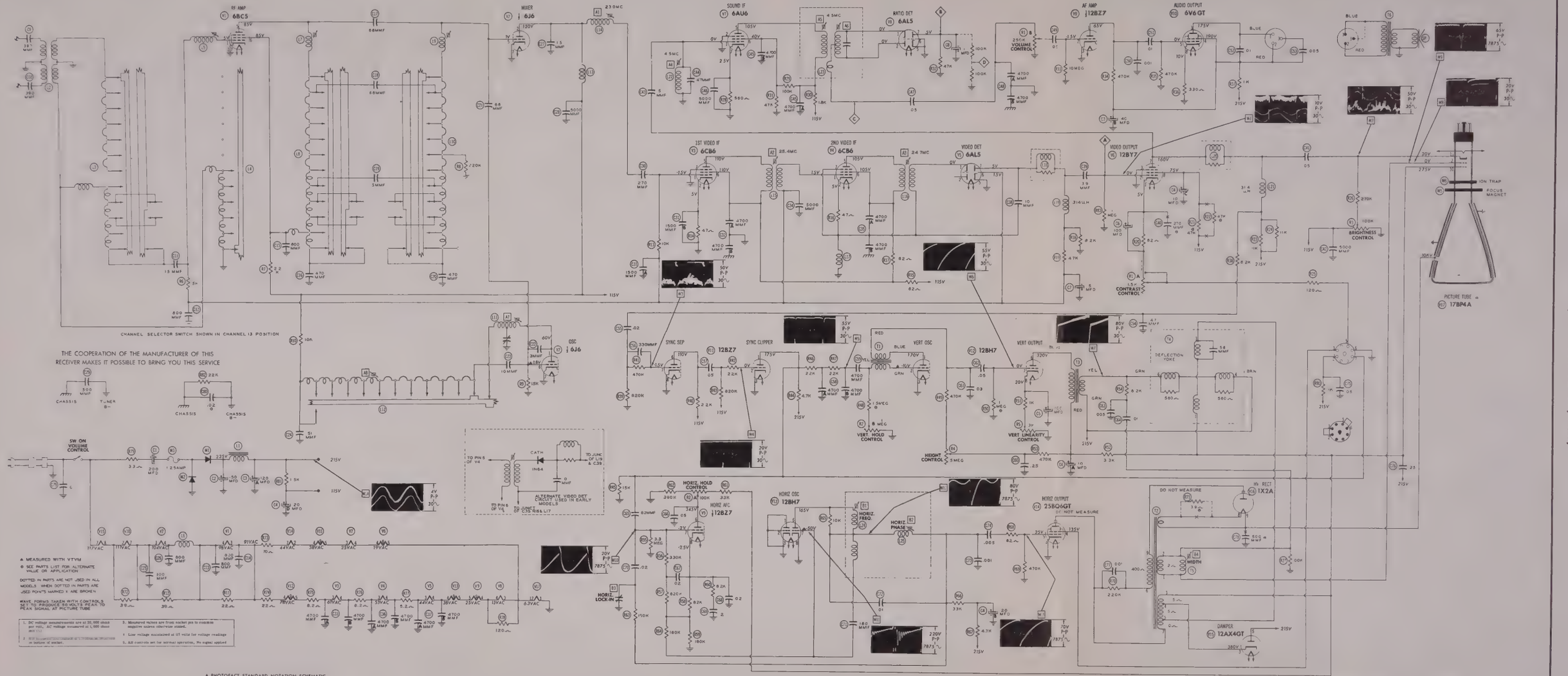
RF AMP V1 6BC5
MIXER V2 ½ 6J6
OSC V2 ½ 6J6
SOUND IF V7 6AU6
RATIO DET V8 6AL5
AF AMP V9 ½12BZ7
AUDIO OUTPUT V10 6V6GT
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
VIDEO DET V5 6AL5
VIDEO OUTPUT V6 12BY7
SYNC SEP V11 12BZ7
SYNC CLIPPER
VERT OSC
VERT OUTPUT V12 12BH7
HORIZ HOLD CONTROL
HORIZ AFC V11 ½12BZ7
HORIZ OSC V13 12BH7
HORIZ OUTPUT V14 25BQ6GT DO NOT MEASURE
HV RECT V16 1X2A
DAMPER V15 12AX4GT
PICTURE TUBE V17 17BP4A
VOLUME CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
VERT LINEARITY CONTROL
VERT HOLD CONTROL
HEIGHT CONTROL
HORIZ FREQ.
HORIZ PHASE
HORIZ LOCK-IN
WIDTH
ION TRAP
FOCUS MAGNET
DEFLECTION YOKE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
SW ON VOLUME CONTROL
ALTERNATE VIDEO DET CIRCUIT USED IN EARLY MODELS OF C35, R84, L17
▲ MEASURED WITH VTVM
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Base diagram of tube sockets as viewed from bottom of socket.
3. Measured values are from socket pin to common negative source unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation. No signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SILVERTONE MODELS 1161-17 (Ch. 110.702-10), 1171-17 (Ch. 110.702-10, -50)

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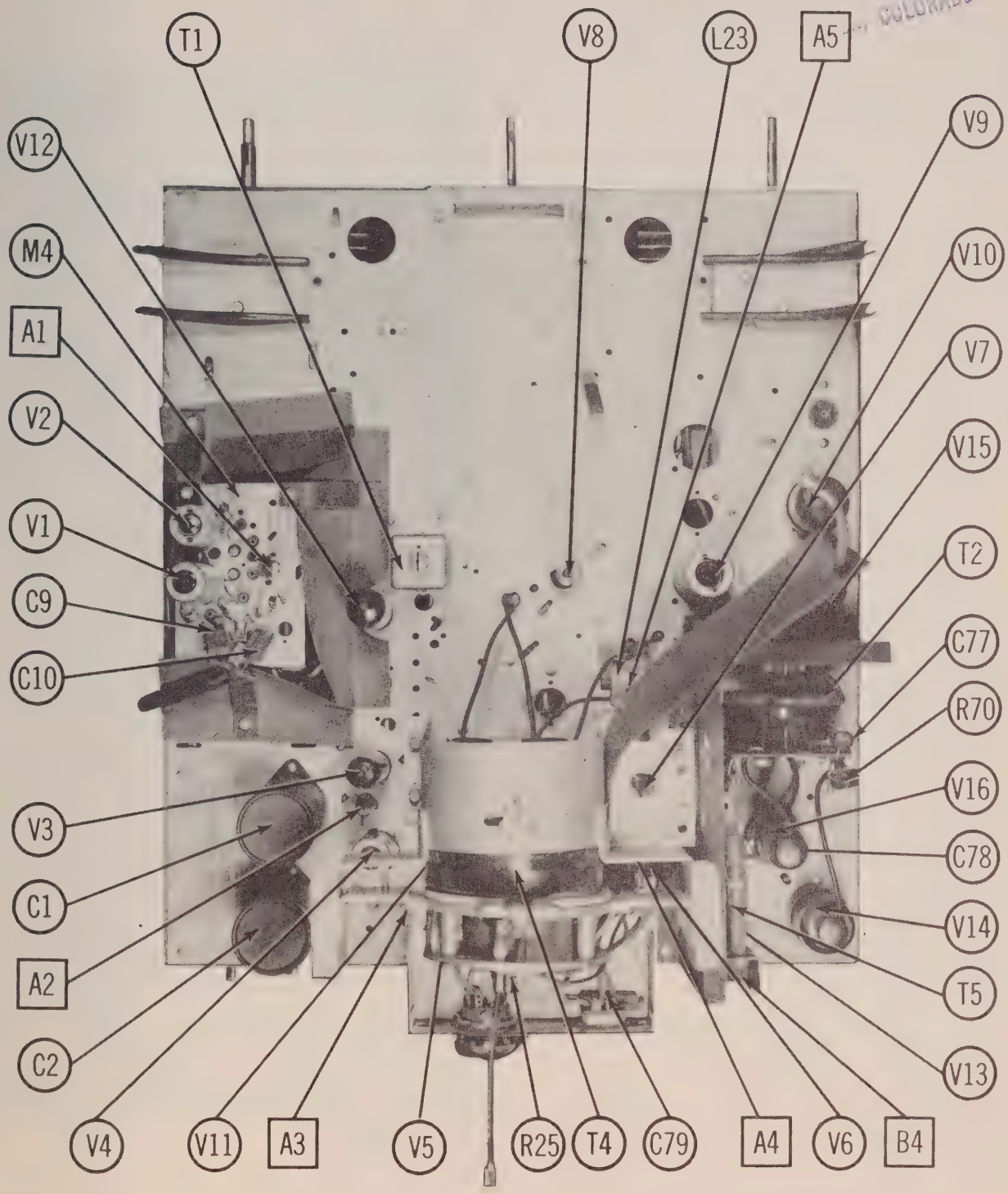
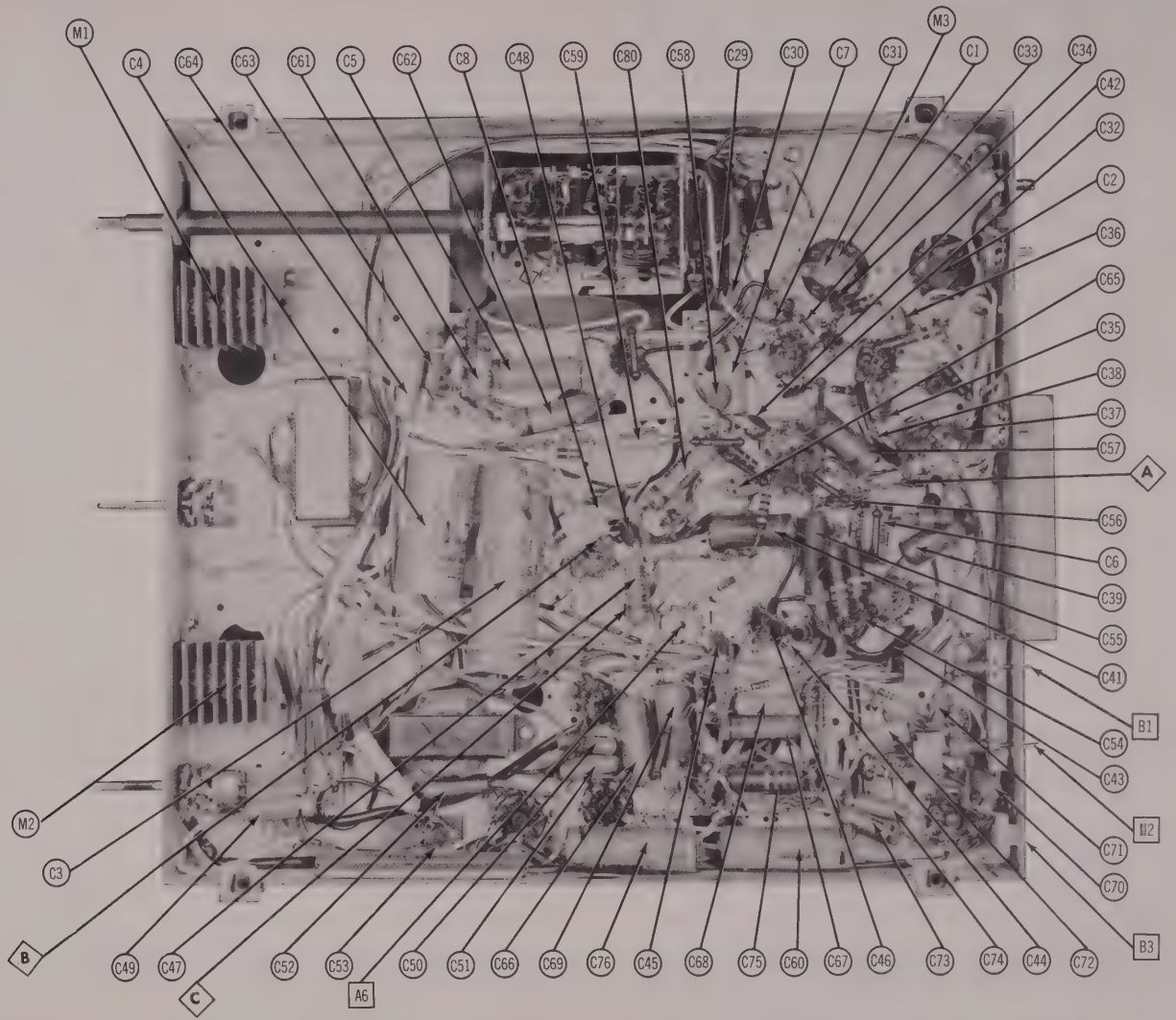


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART

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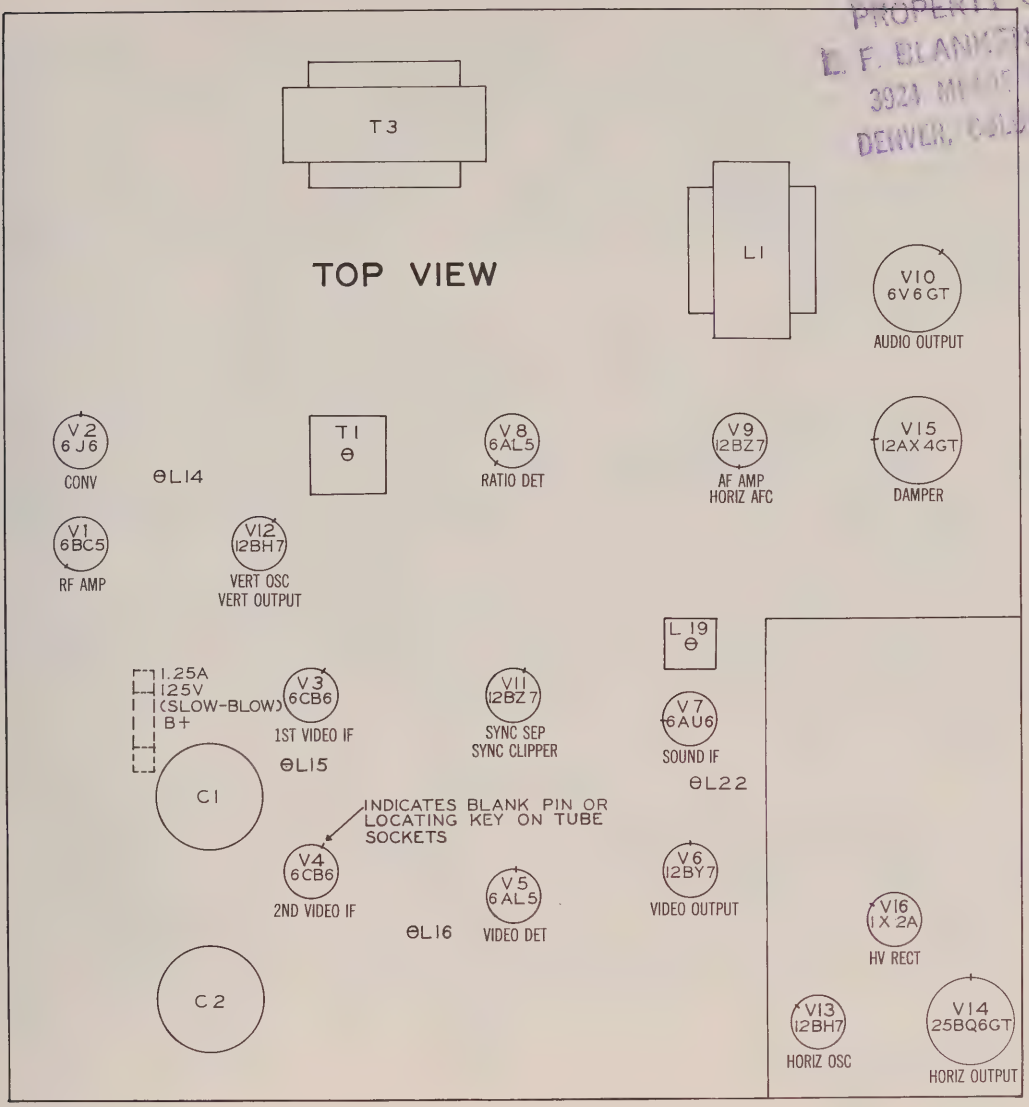


TUBE FAILURE CHECK CHART

The following chart list tubes whose failures are most likely to produce the indicated symptoms.

Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1, M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6.
No pic, no sound, has snow - V1, V2, V3.
No pic, has sound, has raster - V6, V17.
Has pic, no sound - V7, V8, V9, V10,

SYNC FAILURE
No vert. sync - V11, V12.
No horiz. sync - V9, V11, V13.
No vert. or horiz. sync - V11.

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V17.
No vertical deflection - V12
Poor vert. linearity or foldover - V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, M1, M2
Vert. off freq. - V11, V12
Horiz. off freq. - V9, V11, V13

Note: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C7. Connect the positive lead to chassis.
Set contrast control 1/4 turn clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	230MC (Unmod)	Any	DC probe to point (A) Low side to B-.	A1	Adjust for maximum deflection. Attenuate generator output to maintain less than 5 Volts at VTVM.
2.	"	"	25.4MC	"	"	A2	"
3.	"	"	24.7MC	"	"	A3	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Leave battery connected as under Video IF Alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.2MC 25.7MC	Any	Vert. amp to point (A) Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1, A2 and A3. for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to B-. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 2 (grid) of 12BY7 (V6). Low side to B-.	4.5MC (Unmod)	Any	DC probe to point (B) Common to B-.	A4, A5	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point (C) Common to point (D)	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 2 (grid) of 12BY7 (V6). Low side to B-.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B) Low side to chassis.	A4, A5	Disconnect stabilizer capacitor C8. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
6.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A6	Reconnect capacitor C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A5 for maximum amplitude and straightness of crossover lines.

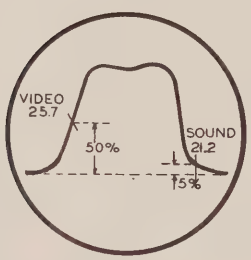


FIG.1

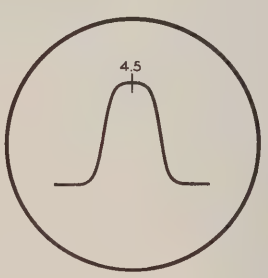


FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

PROPERTY OF
[illegible]
3924 MEADE ST.
DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point (A) Low side to chassis.	A7	Adjust to place Video marker at 50% on response curve as in Fig. 4.
8.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for video marker placement as in Fig. 4. If necessary make slight compromise adjustment of A7 for any individual channel then recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
9.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A8	Adjust to place video marker at 50% on response curve as in Fig. 4.
10.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for video marker placement as in Fig. 4. If necessary make slight compromise adjustment of A8 for any individual channel then recheck all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

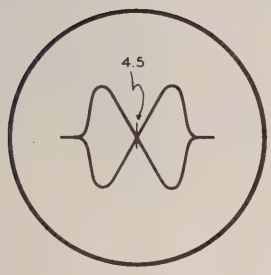


FIG. 3

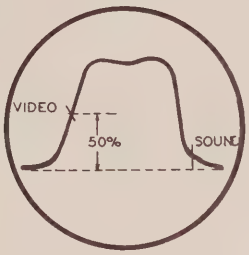
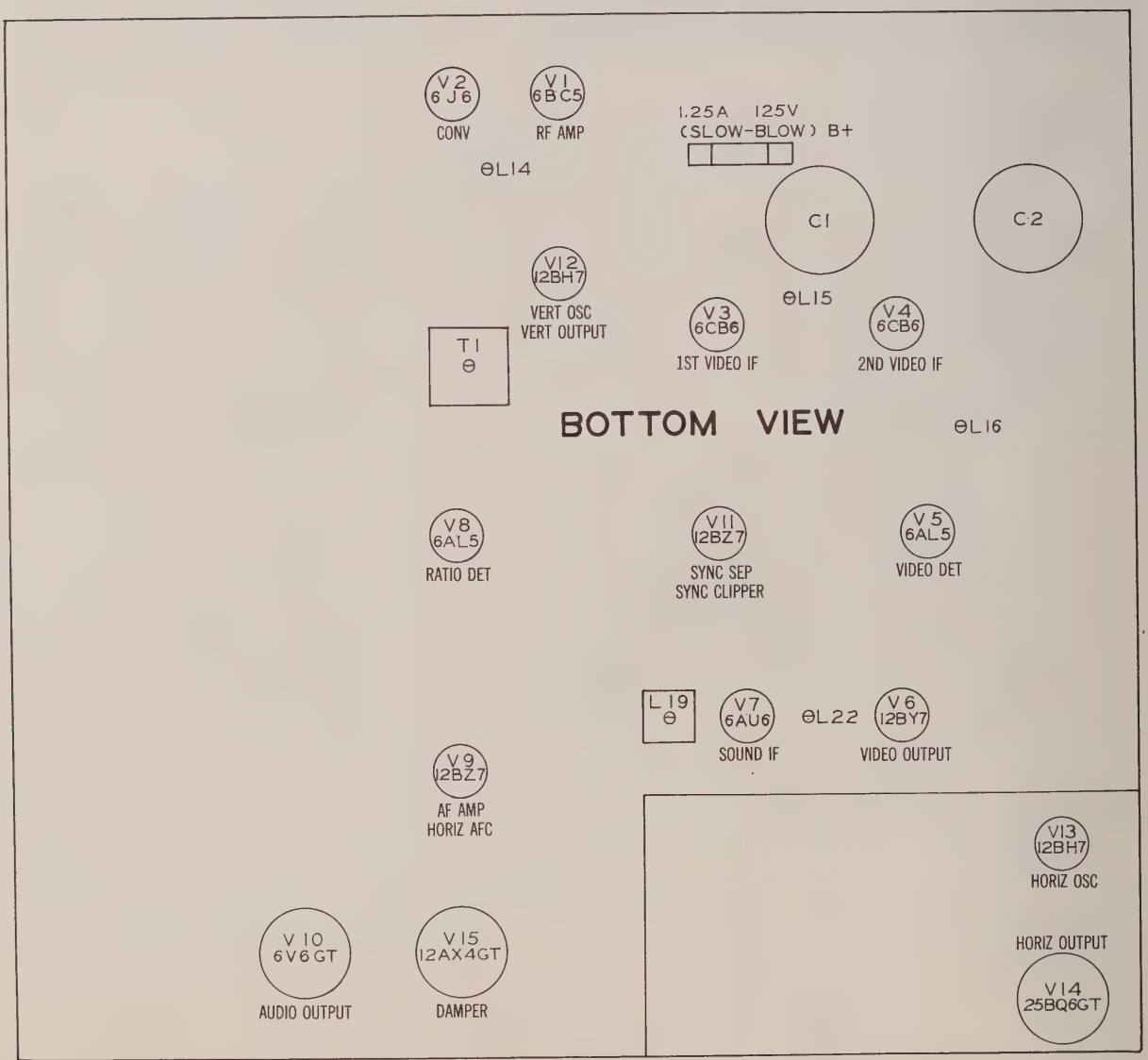


FIG. 4

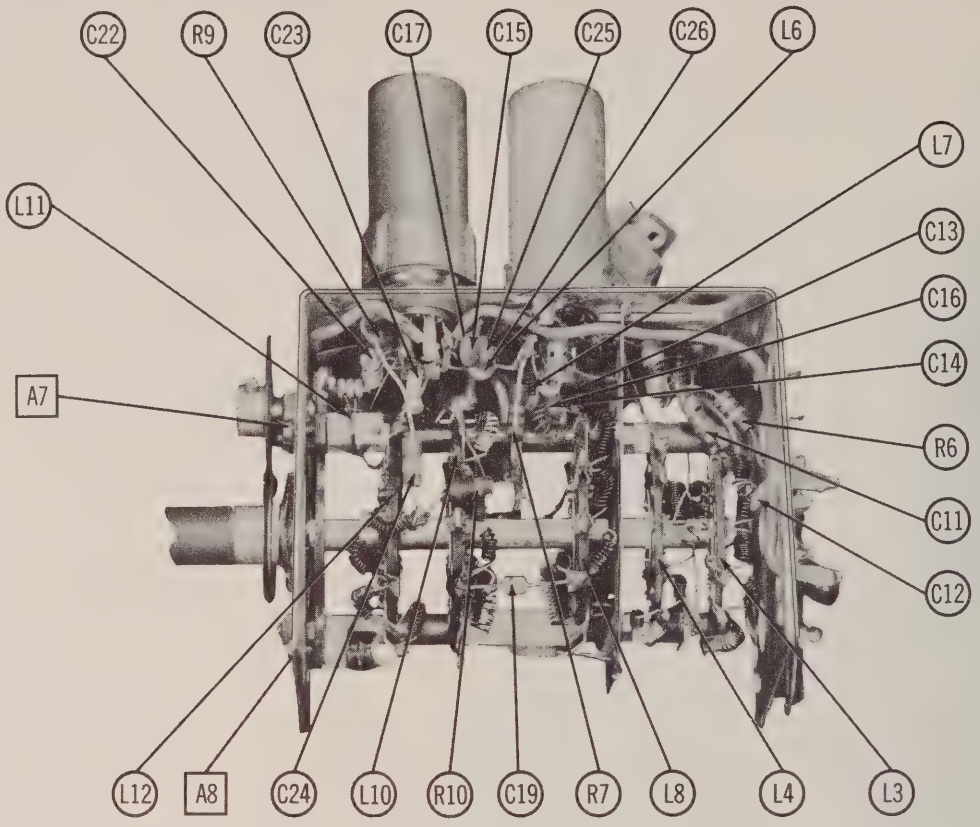
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	72KΩ	0Ω	42Ω	45Ω	†3.7KΩ	†3.7KΩ	0Ω		
V 2	6J6	†11.5KΩ	†1.5KΩ	50Ω	45Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	67KΩ	47Ω	40Ω	33Ω	†1.6KΩ	†1.6KΩ	0Ω		
V 4	6CB6	59KΩ	47Ω	28Ω	28Ω	†1.7KΩ	†1.7KΩ	.27Ω		
V 5	6AL5	.8Ω	INF	18Ω	16Ω	0Ω	59KΩ	8.2KΩ		
V 6	12BY7	220Ω	1 Meg	0Ω	8Ω	1.6Ω	5.5Ω	†560Ω	†27KΩ	0Ω
V 7	6AU6	2Ω	0Ω	11Ω	8Ω	†3.3KΩ	35KΩ	560Ω		
V 8	6AL5	INF	INF	1.6Ω	5Ω	0Ω	0Ω	47KΩ		
V 9	12BZ7	†470KΩ	10Meg	0Ω	5Ω	11Ω	#400KΩ	1.1Meg	260KΩ	
V 10	6V6GT	0Ω	54Ω	†1.4KΩ	†1KΩ	470KΩ	0Ω	50Ω	330Ω	
V 11	12BZ7	†4.7KΩ	850KΩ	0Ω	16Ω	11Ω	†3.7KΩ	1.3Meg	0Ω	14Ω
V 12	12BH7	#1.3Meg	1.9Meg	0Ω	40Ω	39Ω	#5KΩ	1 Meg	1.5KΩ	37Ω
V 13	12BH7	0Ω	0Ω	0Ω	16Ω	11Ω	#†38KΩ	350KΩ	0Ω	13Ω
V 14	25BQ6GT	470KΩ	16Ω	1.1Meg	†1KΩ	470KΩ	INF	24Ω	0Ω	Top Cap #15Ω
V 15	12AX4GT	0Ω	INF	400KΩ	0Ω	14KΩ	INF	56Ω	54Ω	
V 16	1X2A	PINS 1 - 9 HAVE INF RESISTANCE								Top Cap #220KΩ
V 17	17HP4A	0Ω	100KΩ	Pin 10 #15Ω	Pin 11 320KΩ	Pin 12 1.6Ω				

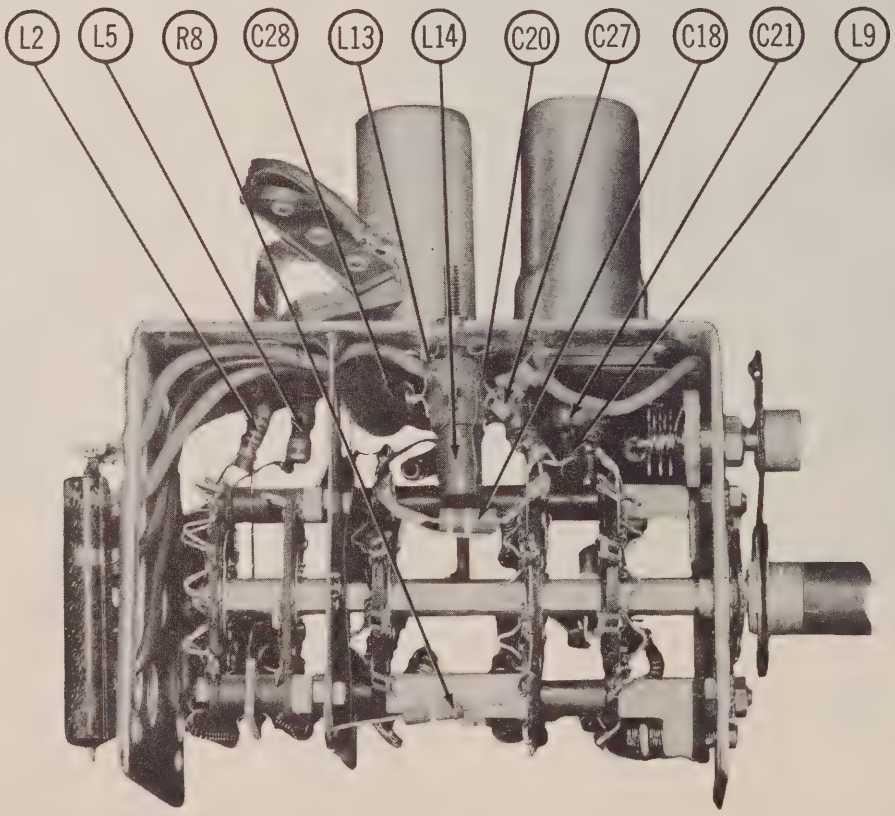
† MEASURED FROM OUTPUT OF M1.
# MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART

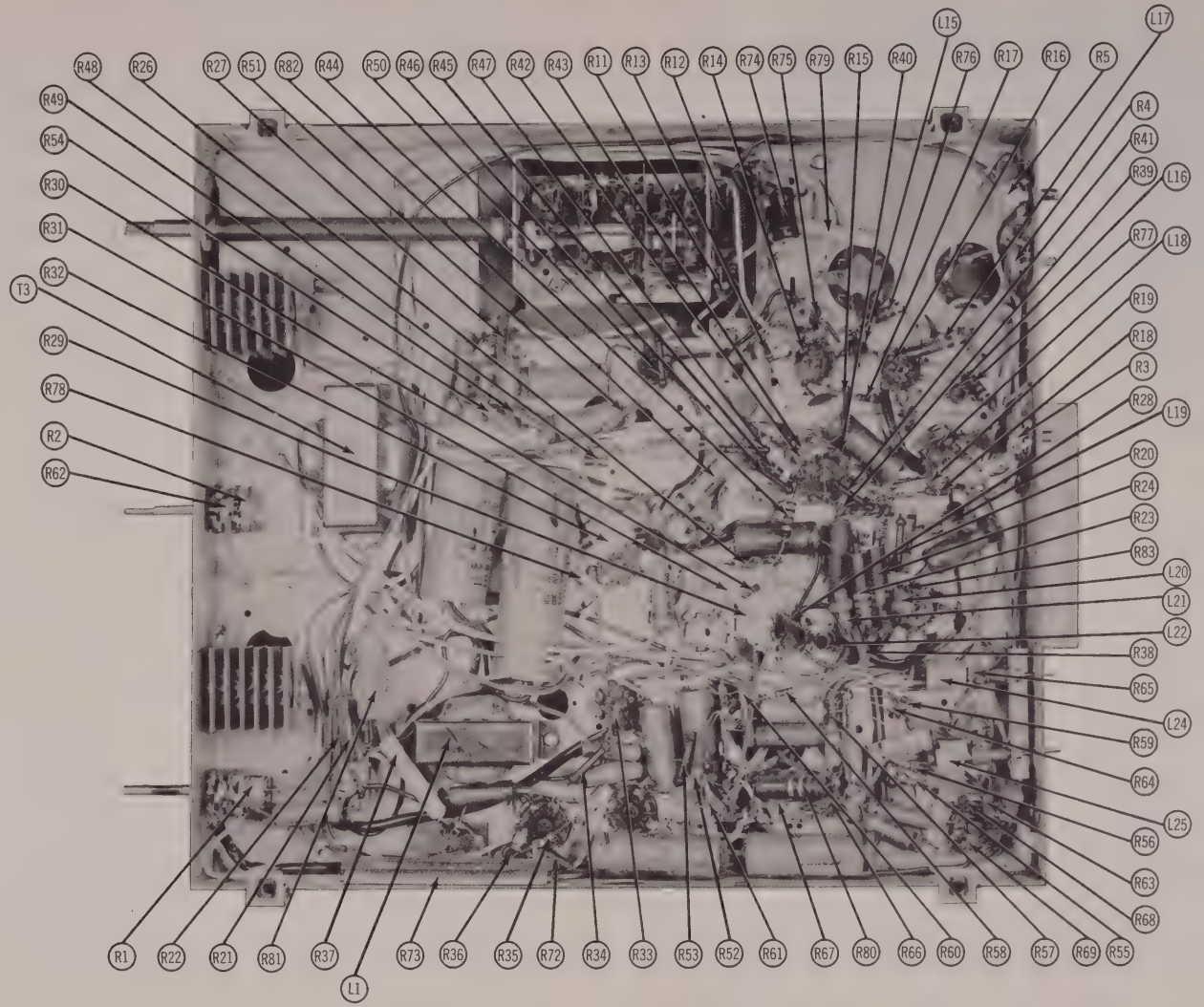


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
L. F. BLANKENSHIP



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS

CAUTION!!

When servicing this receiver , line isolation should be employed. One side of the AC line is tied to chassis through a 220KΩ resistor and a .01MFD capacitor in parallel. Dangerous electrical shock and/or damage to the receiver and/or test equipment may result if receiver should become grounded.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Check yoke for open. Check the 56MMF capacitor across 1/2 of the horizontal yoke for short on leakage.

INSUFFICIENT SWEEP

Subsitute V9, V13, V14 and V15. Check waveform at W13.

If Satisfactory	If Unsatisfactory
Check T2, C76, R80 and C79.	Check C73, C74 and other components associated with V13 and V9B.

DRIVE LINES

Substitute V14 and V15. Check C73, C76 and C75. Check T2.

COMPRESSED LEFT SIDE

Substitute V13, V14 and V15. Check waveform at W13.

FOLDS

If Satisfactory	If Unsatisfactory
Check T2 and other components associated with V14 and V15.	Check coupling network between V13 and V14.

XMAS TREE EFFECT

Substitute V13. Check L24, C71 and C72.

VERTICAL

LOSS OF SWEEP

Substitute V12. Check signal at W6.

If Satisfactory	If Unsatisfactory
Check T3, C4A and other components associated with the vertical output stage.	Check T2, C62, C61, C60 and other components of the vertical oscillator circuit.

INSUFFICIENT SWEEP

Substitute V12. Proced as outlined under VERTICAL LOSS OF SWEEP.

COMPRESSED AT BOTTOM

Substitute V12. Check C5, C4A, T3, C60 and C61. Check yoke.

FOLDS

Substitute V12. Check C62, C60, C61 and T3. Check other components associated with V12.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V9 and V11. Check C65, C66, C67, C68, C69 and C70. Check other components associated with V9B and V11.

CRITICAL SYNC

Substitute V9 and V11. Check C66. Procede as outlined under HORIZONTAL LOSS OF SYNC.

PULLING PICTURE

Check C68 and C69 for leaky or open condition.

VERTICAL

LOSS OF SYNC

Substitute V11 and V12. Check C55, C56, C57 and other components associated with V11. Check vertical integrator network. Check C59.

CRITICAL SYNC

Substitute V11 and V12. Check waveform at W3.

If Satisfactory	If Unsatisfactory
Procede as outlined under VERTICAL LOSS OF SYNC	Check video amplifier and video detector stages for signal overload and sync clipping.

TRIGGERING

Substitute V11 and V12. Check circuits of V11 and V12 for filament lead dress.

VIDEO

SOUND BARS

Check adjustment of 4.5MC take-off trap, A4. Check setting of Local Oscillator.

POOR RESOLUTION

Substitute V1, V2, V3, V4 and V5. Check Video IF alignment as outlined in the alignment table. Check components associated with the Video IF stages.

POOR CONTRAST

Substitute V5 and V6. Check C39 and C41. Check components associated with V5 and V6. Check picture tube.

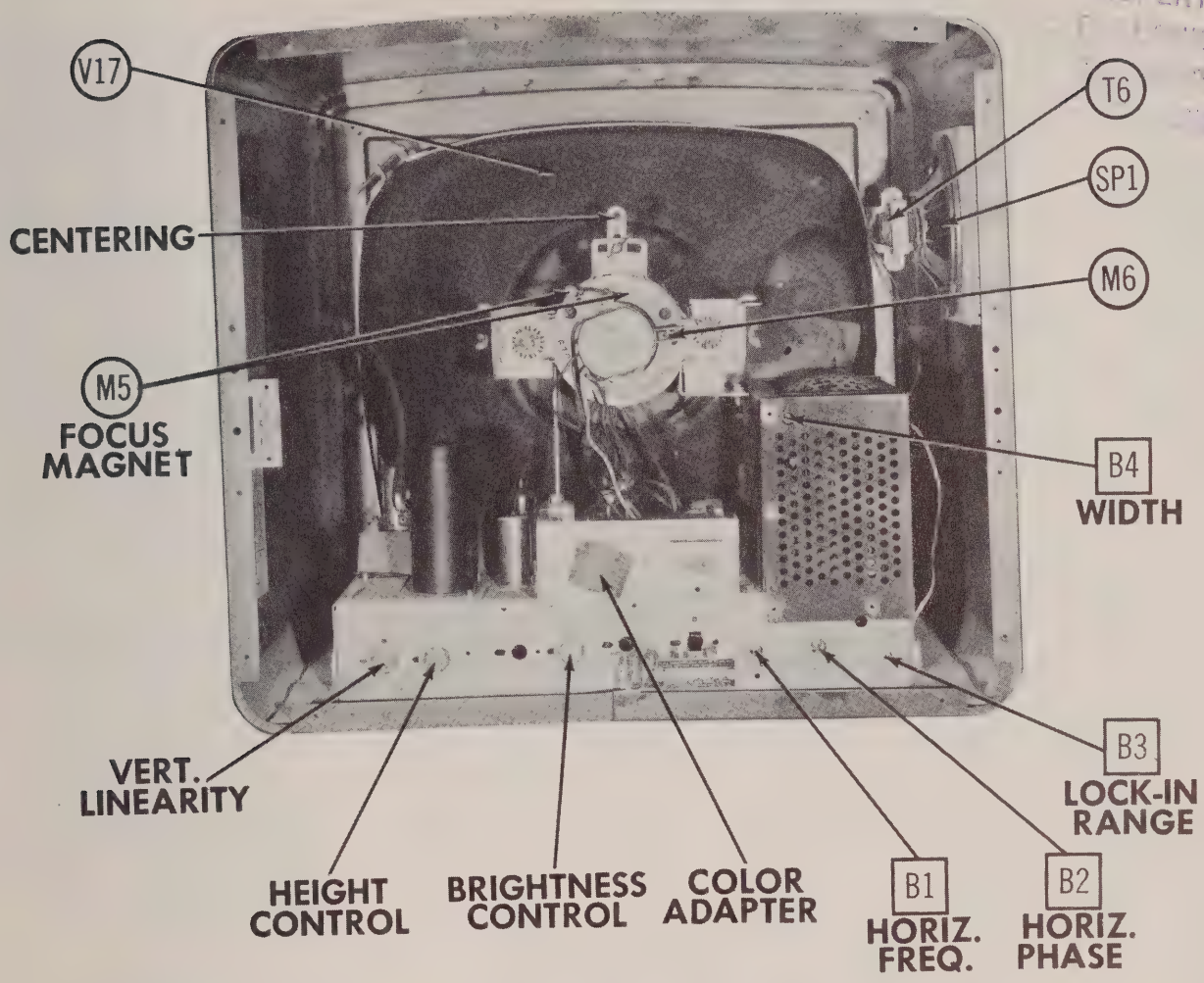
SMEAR

Substitute V4 and V5. Check L20 and L21 for open. Check C6 for open on leaky condition. Check other components associated with V4 and V5. Check picture tube.

ONE BLACK BAR ACROSS PICTURE

Check RF tuner, video IF, video detector and video output stages for heater to cathode leakage. Check picture tube for heater to cathode leakage.

PROPERTY OF
...NSHIP
... ST.
...MDO



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to the center of its range. Short across the horizontal phase coil, L25. Adjust the horizontal frequency slug (B1) untill the picture synchronizes horizontally. Remove the short from L25 and connect the low capacity probe of an oscilloscope to the junction of L24 and L25 to observe the waveform.

Adjust the horizontal phase slug (B2) for a response curve with broad and narrowpeaks of equal height as in Fig. 5.

Adjust the horizontal lock in trimmer (B3) so that the horizontal hold control is effective at both extremes of its rotation. Adjust the width slug (B4) for a picture slightly wider then necessary to fill the picture mask horizontally.

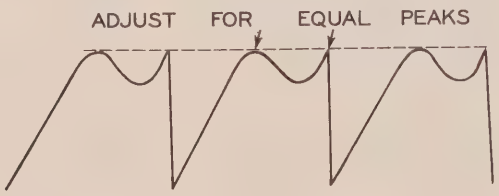


FIG. 5

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp	6CB6	6CB6	7CM	
V5	Video Detector	6AL5	6AL5	9BT	
V6	Video Detector	12BY7	12BY7	9BF	
V7	Sound IF Amp	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier Horiz. AFC	12BE7	12BZ7	9A	
V10	Audio Output	6V6GT	6V6GT	7B	
V11	Sync. Seperator Sync. Clipper	12BE7	12BZ7	9A	
V12	Vert. Oscillator Vert. Output	12BH7	12BH7	9A	
V13	Horiz. Oscillator	12BH7	12BH7	9A	
V14	Horiz. Output	25BQ6GT	25BQ6GT	8AM	
V15	Damper	12AX4GT	12AX4GT	4CG	
V16	HV Rectifier	1X2A	1X2A	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V17A	17BP4A	17BP4A		12D	① Circuit changes necessary
		17BP4	①	12D	② 3/8" longer
		17HP4	①	12C	
		17RP4	①	12C	
B	20CP4	20CP4		12D	
		20CP4A	①	12D	
		20DP4	②	12D	
		20DP4A	①②	12D	
		20HP4	①②	12C	
		20MP4	①②	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	200	150	A20158	AFH81-71		XB006		FF218.1	TVL-1431	
C2	150	300	A20159	AFH1-73		XA012		FP239.3	TVL-1584	
C3A	120	300 }	A20161	AFH2-35		rXA012			TVL-2589	Red
B	40	300 }				BR4035				Blue
C4A	10	450 }	A20160	PRS450/10-10		BRD1145B		TCD72	TVA-2722	Red
B	20	300 }		PRS450/20-20		EDL2345		TCD65	TVA-2730	Blue
C	10	300 }								Yellow
D	20	300 }								Orange
C5	100	25	A20130	PRS25/100		BRH251A		TC2501	TVA-1207	
C6	100	6	A20156	PRS6/100		BRH601		TC2501	TVA-1101	
C7	5	12	A20157	PRS150/4		BR550		TC30	TVA-1203	
C8	1	50	A20138	PRS150/4		BRF-1-50T		TC31	TVA-1300	
C9	390	500	A190-137	1468-0004	D6-391	5W5T4	GP2K-391	MC343	1FM-34	
C10	390	500	A190-137	1468-0004	D6-391	5W5T4	GP2K-391	MC343	1FM-34	
C11	15			SII5	DD-150		GP1K-150	UC-5415	5GA-Q15	
C12	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C13	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C14	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C15	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C16	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C17	.68				TCZ-.68		NP0K-R68			
C18	.68				TCZ-.68		NP0K-R68			
C19	.5				TCZ-.5		NP0K-R50			
C20	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C21	.68				TCZ-.68		NP0K-R68			
C22	3						N150K-030			
C23	10			SII0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C24	.51									
C25	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C26	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C27	15			SII5	D6-150		GP1K-150	UC-5415	5GA-Q15	
C28	5000			BPD-005	DD-502	TM5D5	81-005	DC-525	5HK-D5	
C29	1500		A19148	BPD-0015	DD-152	TM5D15	801-015	DC-5215	5HK-D15	
C30	270	500	A190-133	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C31A	1500	}	A191147	BPD-2X0015	DD-2-152	TM5DD15	812-015	DCD-5215	5HK-2D15	
B	1500	}								
C32A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	{81-005	DCD-525	5HK-2D47	
B	4700	}					{81-005			
C33A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	{81-005	DCD-525	5HK-2D47	
B	4700	}					{81-005			
C34	5000		A19109	BPD-005	DD-502	TM5D5	81-005	DC-525	5HK-D5	
C35A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	{81-005	DCD-525	5HK-2D47	
B	4700	}					{81-005			
C36A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	{81-005	DCD-525	5HK-2D47	
B	4700	}					{81-005			
C37A	1500	}	A19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500	}								
C38	10			A555-101	SII0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1
C39	.05	600	A194-160	P688-05	DF-503	PT5E8S			PT615	6TM-S5
C40	270		A190-133	SI270	D6-271		GP2K-271		UC-5327	5GA-T27
C41	.05	600	A194-160	P688-05	DF-503	PT5E8S			PT615	6TM-S5
C42	9800		A19109	BPD-005	DD-502	TM5D5	81-005		DC-525	5HK-D5
C43	5		A555-100	SI5	TCZ-4.7	5W5V5	GP1K-050		UC-555	5GA-V5
C44	47			SI47	D6-470	5R5Q5	GP1K-470		UC-5447	5GA-Q47
C45A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	81-005		DCD-525	5HK-2D47
B	4700	}					81-005			
C46	5000		A19109	BPD-005	DD-502	TM5D5	81-005		DC-525	5HK-D5
C47	.05	200	A194-64	P288-05	DF-502	PT2S5			PT415	2TM-S5
C48A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	81-005		DCD-525	5HK-2D47
B	4700	}					81-005			
C49	.05	200	A194-64	P288-05	DF-503	PT2S5			PT415	2TM-S5
C50	.001	600	A194-145	P688-001	D6-102	PTE8D1	GP2L-102		PT621	6TM-D1
C51	.01	600	A194-155	P688-01	D6-103	PTE8S1	GP2-333-103		PT611	6TM-S1

PARTS LIST AND DESCRIPTIONS (CONT.)

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	.01	600	A194-155	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C53	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C54	47	500	A190-115	1468-00005	D6-470	5W5Q5	GP1K-470	MC525	1FM-45	
C55	.02	600	A194-156	P688-02	DF-503	PTE6S2		PT612	6TM-S2	
C56	330	500	A190-135	1469-00035						
C57	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C58A	4700	}	A19163	BPD-2X0047	DD-2-502	TM5DD5	81-005	DCD-525	5HK-2D47	
B	4700	}					81-005			
C59	4700	500	A192-163	1464-005		IDR5D5		MCB465	MB-25	
C60	.25	600	A194-115	684-25		PTE6P25		PT6025	6TM-P25	
C61	.02	600	A194-156	P688-03		PTE6S3		PT613	6TM-S3	
C62	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C63	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C64	.01	600	A194-155	P686-01	DF-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C65	82	500	A190-121							
C66	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C67	.02	600	A194-156	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C68	.02	600	A194-156	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C69	.2	200	A19156	P488-22		PTE4P22		TP429	2TM-P22	
C70	.02	600	A194-156	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C71	.180	500	A190-129	1469-0002		5R572		MC5237	MS-32	
C72	.01	600	A19170							
C73	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C74	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C75	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C76	.25	600	A194-115	684-25		PTE6P25		PT6025	6TM-P25	
C77	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C78	500	20000	A1998-3	RV20C	TV3-502	MM-C20T5	413-501		20QDC-T5	Note 1
C79	.01	600	A19108	589ZGXY-01		PJ6S1		PT615	6TM-S1	
C80	.02	600	A194-156	P688-02	DF-203	PTE6S2		PT612	6TM-S2	Note 2

Note 1. Not used in all Models.
Note 2. Some Models use .047MFD in this application (part #A19171 or A19164)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	A24124	QJ-231*	RTV-306	SBB-684-B	UF152L	Contrast-Panel
B	250KΩ	½					UR254A †	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	100KΩ	½	A24128	QJ-414**	RTV-383		UF15L ††	Horiz. Hold-Panel
B	1 Meg	½					UR16L	Vert. Hold-Rear
R3A	100KΩ	½	A24110	Q11-128	AG-69-8	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R3A
R4A	5 Meg	½	A24111	Q11-141	AG-85-8	AB-87	SU-67	Height
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R4A
R5A	3000Ω	2	A24114	WK-3000	A43-3000	VK-133	R3000L	Vert. Lin. -Wire Wound
B	Shaft		Not Req.	Not Req.	FK3-1/4	Not Req.	Not Req.	Attach to R5A

* CONCENTRIKIT EQUIVALENT- KIT K-2, BASE ELEMENTS & SHAFTS B1?-110 & P1-106 (Panel)
B13-130 & R1-126 (Rear) & SWITCH 76-1.
** CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENT & SHAFTS B1-128 & P1-106 (Panel)
B11-137 & R1-126 (Rear).
† UNIVERSAL REPLACEMENT (MALLORY EXACT REPLACEMENT PART NO. UE1108).
†† UNIVERSAL REPLACEMENT (MALLORY EXACT REPLACEMENT PART NO. UE1227).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R6	15KΩ	½			
R7	2200Ω	½		BTS-2200	
R8	220KΩ	½		BTS-220K	
R9	15KΩ	½			
R10	10KΩ	½			
R11	22Ω	2	A21124		
R12	39Ω	2	A21125		
R13	470Ω	½	A231-1173		
R14	47Ω	½	A231-1117		
R15	82Ω	½	A231-1123	BTS-82	
R16	47Ω	½	A231-1117		
R17	82Ω	½	A231-1123	BTS-82	
R18	8200Ω	½	A231-1171	BTS-8200	
R19	47KΩ	½	A231-1189	BTS-47K	
R20	82Ω	½	A231-1123	BTS 82	
R21	47KΩ	½	A231-1189	BTS-47K	Note 1
R22	47KΩ	½	A231-1189	BTS-47K	Note 1
R23	11KΩ	2	A233-74		
R24	11KΩ	2	A233-74		
R25	120Ω	½	A231-1127	BTS-120	
R26	270KΩ	½	A231-1207	BTS-270K	
R27	100KΩ	½	A231-1197	BTS-100K	
R28	560Ω	½	A231-1143	BTS-560	
R29	100KΩ	½	A231-1197	BTS-100K	
R30	1800Ω	½	A231-1155	BTS-1800	
R31	47KΩ	½	A231-1189	BTS-47K	
R32	47KΩ	½	A231-1189	BTS-47K	
R33	10Meg	½	A231-1245	BTS-10Meg	
R34	470KΩ	½	A231-1213	BTS-470K	
R35	470KΩ	½	A231-1213	BTS-470K	
R36	330Ω	1	A232-1137	BTA-330	
R37	1000Ω	4	A21102	1 3/4A-1000	
R38	8200Ω	½	A231-1171	BTS-8200	
R39	820KΩ	½	A231-1219	BTS-820K	
R40	2200Ω	½	A231-1157	BTS-2200	
R41	470KΩ	½	A231-1213	BTS- 470K	
R42	22KΩ	½	A231-1181	BTS-22KΩ	
R43	820KΩ	½	A231-1219	BTS -820K	
R44	4700Ω	1	A232-1165	BTA-4700	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R45	15KΩ	½	A232-1177	BTA-15K	
R46	22KΩ	½	A231-1181	BTS-22K	
R47	22KΩ	½	A231-1181	BTS-22K	
R48	1.5Meg	½		BTA-1.5Meg	Note 2
R49	470KΩ	½	A231-1213	BTS-470K	
R50	1 Meg	½	A231-1221	BTS-1 Meg	Note 3
R51	1000Ω	½	A231-1149	BTS-1000	
R52	3300Ω	2	A233-1181	BTS-3300	
R53	470KΩ	½	A231-1213	BTS-470K	
R54	8200Ω	½	A231-1171	BTS-8200	
R55	3.3Meg	½	A231-1233	BTS-3.3Meg	
R56	330KΩ	½	A231-1209	BTS-330K	
R57	820KΩ	½	A231-1219	BTS-820K	
R58	82KΩ	½	A231-1195	BTS-82K	
R59	180KΩ	½	A231-1203	BTS-180K	
R60	8200Ω	½	A231-1171	BTS-8200	
R61	33KΩ	½	A231-1185	BTS-33K	
R62	390KΩ	½	A231-1211	BTS-390K	
R63	150KΩ	½	A231-1201	BTS-150K	
R64	180KΩ	½	A231-1203	BTS-180K	
R65	10KΩ	½	A231-1173	BTS-10K	
R66	33KΩ	½	A231-1185	BTS-33K	
R67	4700Ω	½	A231-1165	BTS-4700	
R68	82Ω	½	A231-1123		
R69	470KΩ	½	A231-1213	BTS-470K	
R70	220KΩ	½	A233-1205	BTS-220K	
R71	3.9Ω	3			Note 4
R72	39Ω	1	A21125		
R73	70Ω	10	A21120	1 3/4A-75	
R74	22Ω	5	A21133	1 3/4A-22	
R75	8.2Ω	1	A23154		
R76	8.2Ω	1	A23154		
R77	8.2Ω	1	A23154		
R78	120Ω	½	A231-1127	BTS-130	
R79	3.3Ω	5	A21123		
R80	11KΩ	2	A233-74		
R81	1500Ω	15	A21117	2D-1500	
R82	220KΩ	½	A233-1205	BTS-220K	
R83	1 Meg	½	A231-1221	BTS-1 Meg	

Note 1. Some models use one 27KΩ (1 Watt) resistor in this application.
Note 2. Some models use a 1 Meg resistor in this application.
Note 3. Some models use a 1.5Meg resistor in this application.
Note 4. Not used in all models.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI	RATING: DC RESISTANCE SEC	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T1	6Ω	16Ω	A-10134	A-6122	A-4003	TBO-2	A-97Y	208T9	Vert. Osc. Trans.
T2	300 tap ⑥ 15Ω, 20Ω	400Ω SEC. 2 .2Ω SEC. 3 0Ω	A-10128						Horiz. Output Trans.
T3	1060Ω	6.5Ω	A-10115-5	A-8112 ①	A-3038	TSO-5	A-98X		Vert. Output Trans.
T4A	35Ω		A-25301-3	DY-12A*	MDF-71	TY-8 ①			Horiz. Deflection Coils
B	62Ω				MWC-2 ②			20HR4	Vert. Deflection Coils
T5	1Ω		A-28275-2						Width Coil

① Drill one new mounting hole.
② Use original deflection coil network.
③ Enlarge mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI	RATING: IMPEDANCE SEC	RATING: DC RES. PRI.	RATING: DC RES. SEC	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	4.8KΩ	3.2Ω	382Ω	.83Ω	38G53 (part of spkr)	A-3877 ①	A-2930 ①	RO-9 ①	S-3X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.2Ω	PC-5866	ST-105 Mod. P5-X	5A07	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (@ CURRENT 1000 ℃)	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.200ADC	61Ω	1.83 Hy.	A-1406	C-2326	C-2996 ①	TR-1733 ①	C-21X

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	MILLER PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	0Ω CT	0Ω CT					
L3	Ant. Coils	0Ω						
L4	Ant. Shunt Coils	0Ω						Ch. 13
L5	Ant. Coil	0Ω						
L6	Fil. Choke	0Ω						Ch. 13
L7	RF Coil	0Ω						
L8	RF Coils	0Ω						
L9	Mixer Grid Coil	0Ω						Ch. 13
L10	Mixer Grid Coils	0Ω						
L11	Osc.-Plate Coil	0Ω	CT					Ch. 13
L12	Osc. Coils	0Ω						
L13	RF Choke	1Ω						
L14	1st. Video IF	.4Ω						
L15	2nd. Video IF	.5Ω	.5Ω	A28305		17-1062		
L16	3rd. Video IF	.5Ω	.5Ω	A28305		17-1063		
L17	RF Choke	.27Ω		A28276	6175	19-3001	CL-1	.82 Microhenry
L18	Series Peaking Coil	8Ω		A28255-3				Wound on resistor
L19	Shunt Peaking Coil	15Ω		A28255-4	4585	19-3300		314 Microhenries
L20	Series Peaking Coil	7Ω		A28255-6				Wound on resistor
L21	Shunt Peaking Coil	15Ω		A28255-4	4585	19-3300		314 Microhenries
L22	Sound IF	2Ω		A28286	1470	17-3400		
L23	Ratio Det.	4Ω	1.3ΩCT	A1201 *	6395			Tertiary Winding -.95Ω Tapped ⑥ 33Ω
L24	Horiz. Osc.	130Ω		A28305				
L25	Horiz. Phase	44Ω		A28304	6210 ■	19-1576 ■		

* Alternate part #A1202
■ Enlarge mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: SILVERTONE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.200A	A-5175	NK5	642	1090A	6S300	300
M2	.200A	A-5175	NK5	642	1090A	6S300	300

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: SILVERTONE PART No. FUSE	SILVERTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG-Slo Blo-P/T	1 1/4A 125VAC	A4942		3151.25 (3AG-1 1/4A-Slo-Blo-P/T)		MDV-1 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	RF Tuner		
M5	Focus Magnet	A3204	
M6A	Ion Trap	A54794	(17" Set only)
B	Ion Trap	A541005	(20" Set only)
B3	Trimmer	A1775	Horiz. Lock (25-280MMF)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

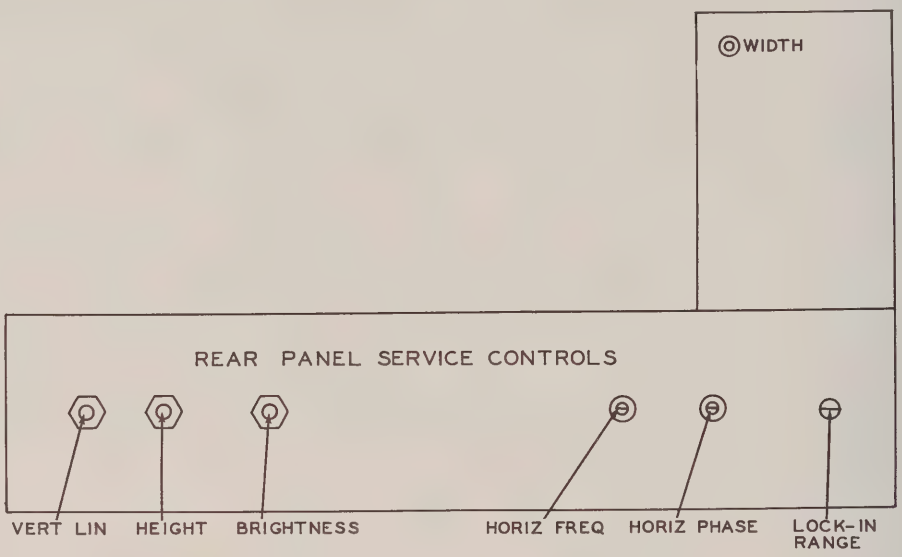
To clean safety glass remove 4 screws and 4 corner clamps, hold safety glass in during this operation.

Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary toremove chassis. (See disassembly instructions):

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of chassis.

Set the Horiz. Hold Control at the mid-position of its range and adjust the Horiz. Freq. slug untill the picture synchronizes horizontally. If synchronization cannot be obtained by the above adjustment see HORIZ: SWEEP CIRCUIT ADJUSTMENTS on page 13.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L23 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for L.V. Power Supply protection (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P.M. Focusing assembly.

Adjust the centering lever from side to side, and up and down untill picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Remove 14 metal screws. Remove rear cover.
3. Remove 2 metal screws. Remove antenna bracket.
4. Disconnect speaker. Remove 2 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

TROUBLE SHOOTING AIDS (CONT.)

AUDIO

WEAK OR NO SOUND

Substitute V7, V8, V9 and V10. Check C3B, C8, C50, C51 and other components of the audio stages.

BUZZ

Check adjustment of Ratio detector secondary. If buzz is still objectionable substitute V8 and readjust. Check C8.

DISTORTED

Substitute V7, V8, V9 and V10. Check adjustment of Sound IF and ratio detector. Check V9A and V10 circuits for distortion using audio signal generator.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Substitute V15, V16, V14 and V13. Check waveform at W13.

If Satisfactory	If Unsatisfactory
Check C78, R71, T2 and other components associated with high voltage circuit.	Check C73, C74 and other components associated with V13 and V14.

WEAK HIGH VOLTAGE

Substitute V15, V16, V14 and V13. Check picture tube. Proceed as outlined under LOSS OF HIGH VOLTAGE.

BLOOMING

Substitute V16. Check C78 and R71. Check picture tube. Proceed as outlined under LOSS OF HIGH VOLTAGE.

POWER

SMALL RASTER

Measure B+.

If Satisfactory	If Low
Substitute V14 and V15. Procede as outlined under HORIZONTAL INSUFFICIENT SWEEP.	Check B plus filter capacitors. Check all B plus circuits for shorts. Substitute rectifiers M1 and M2.

DIM PICTURE, WEAK SOUND

Measure B+. If low, check B+ filter network for shorts. Substitute M1 and M2.

GENERAL

RASTER, NO PICTURE, NO SOUND

Substitute V1, V2, V3, V4, V5 and V6.

SOUND, NO PICTURE

Check video coupling network between V6 and picture tube. Check picture tube.

INTERMITTANT STREAKS

Check high voltage network for corona discharge and arcing.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

PROPERTY OF
L. F. BLANKENSHIP
3054 MEADE ST.
DENVER, COLORADO

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L I [illegible]
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TRUETONE
MODEL D2325-A

TRUETONE
MODEL D2325-A

TRADE NAME	Truetone Model D2325-A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .46 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	High side to pin 1 (grid) of 6BA6 (V1).	1400KC	Tune to 1400KC signal	"	A6	"
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

Replace chassis in cabinet, turn tuning gang fully closed and set pointer parallel to base of cabinet at low frequency end of dial.

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PARTS LIST AND DESCRIPTIONS

TRUETONE
MODEL D2325-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬40	350	8C-18125	AFH4-53		DO46		FP430.6	TVL-4739	
B	■40	350								
C	▲40	350								
D	40	25								
C2	220		8G-16261	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C3	10000		8G-20269	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C3	22		8G-11892	SI22N750	TCN-22		N750K-220		5TCU-Q22	
C5	.05	200	8D-14460	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C6	5		8G-20491				N330K-050			
C7	33		8G-14172							
C8	10000		8G-20269	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C9	.05	200	8D-14460	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C10	10000		8G-20269	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C11A	100		♦201-15005	SI100	♦PC-50	TM5T1	♦1403-01	UC-531	♦100C1	
B	100			SI100		TM5T1		UC-531		
C12	.022	200	8D-17268	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C13	.01	200	8D-17258	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C14	100		8G-19872	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C15	.02	400	8D-17607	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C16	.004	600	8D-10788	P688-004	D6-402	PTE6D4	GP2-333-402	PT624	6TM-D4	
C17	.0047	600	8J-20601	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C18	.022	600	8J-20604			PJ6S22		PT6122	6TM-S22	

♦ Items C11A, C11B, R10 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	A-10A-18703	QJ-232 *		SBBT-520-S	UF16A	Tone-Panel
B	1Meg	½					UR16-T1253	Volume-tapped @ 100KΩ-Rear
C	Switch						US-26	Attach to R1A

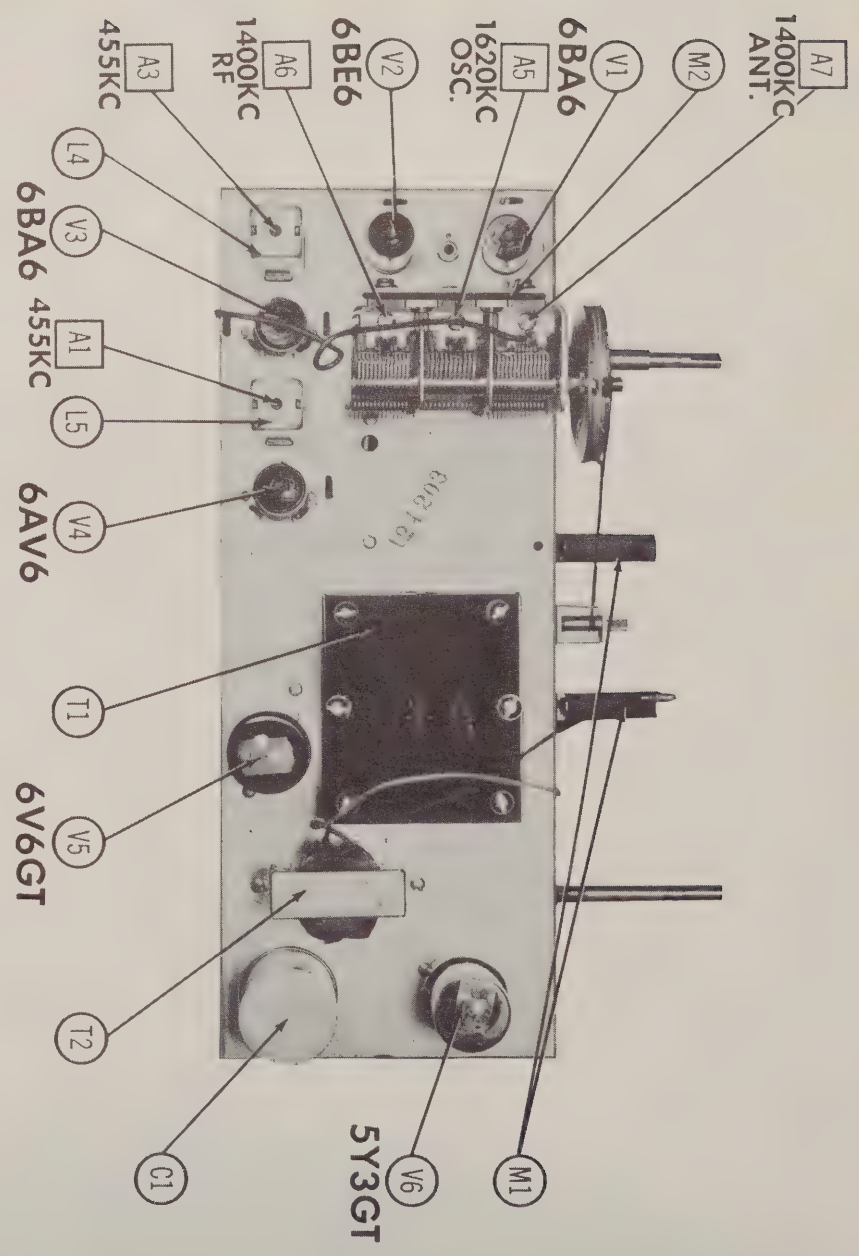
* CONCENTRIKIT EQUIVALENT- KIT K-2, BASE ELEMENTS & SHAFTS B13-137 & P1-204 (Panel) B18-137X & R2-226 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	2.2Meg	½	9B1-33	BTS-2.2Meg	
R3	270Ω	½	9B1-55	BTS-270	
R4	270Ω	½	9B1-55	BTS-270	
R5	1Meg	½	9B1-31	BTS-1Meg	
R6	47KΩ	½	9B1-82	BTS-47K	
R7	270Ω	½	9B1-55	BTS-270	
R8	2.2Meg	½	9B1-33	BTS-2.2Meg	
R9	100Ω	½	9B1-50	BTS-100	
R10	47KΩ	½	♦201-15005	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R11	47KΩ	½	9B1-82	BTS-47K	
R12	6.8Meg	½	9B1-36	BTS-6.8Meg	
R13	470KΩ	½	9B1-94	BTS-470K	
R14	470KΩ	½	9B1-94	BTS-470K	
R15	270Ω	½	9B1-55	BTS-270	
R16	1800Ω	5	9C12-1102	1 3/4A-1750	
R17	3000Ω	5	9C12-2059	1 3/4A-3000	
R18	1.5 Ω	5		1 3/4A-1.5	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
					TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3					
T1	117VAC @ .46A	514VCT .063ADC	5VAC @ 2A	6.3VAC @ 2A	12A21682	PM-8404	P-3051		R-10B ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.2KΩ	3.4Ω	465Ω	.9Ω	12C18143	A-3877 ①	A-2930 ①	RO-9 ①	S-3X ①	①Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	5X7"	PM	3.4Ω	18A19896	57J9	57A1	

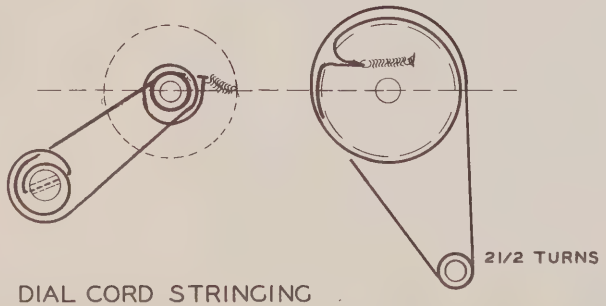
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	TRUETONE PART No.	MILLER PART No.	MEISSNER PART No.	
L1	Loop Ant.	0Ω	2.2Ω	13E-21871			
L2	RF Coil	75Ω	3Ω	201-21685	70-RF	14-1072	
L3	Osc. Coil	.3Ω	6Ω	13D-19698	70-Osc.*	14-1073	
L4	Input IF	15Ω	15Ω	13B-17731	12-C1	16-6758	
L5	Output IF	15Ω	15Ω	13B-17731	12-C2	16-6758	

* Do not use tap on secondary winding.

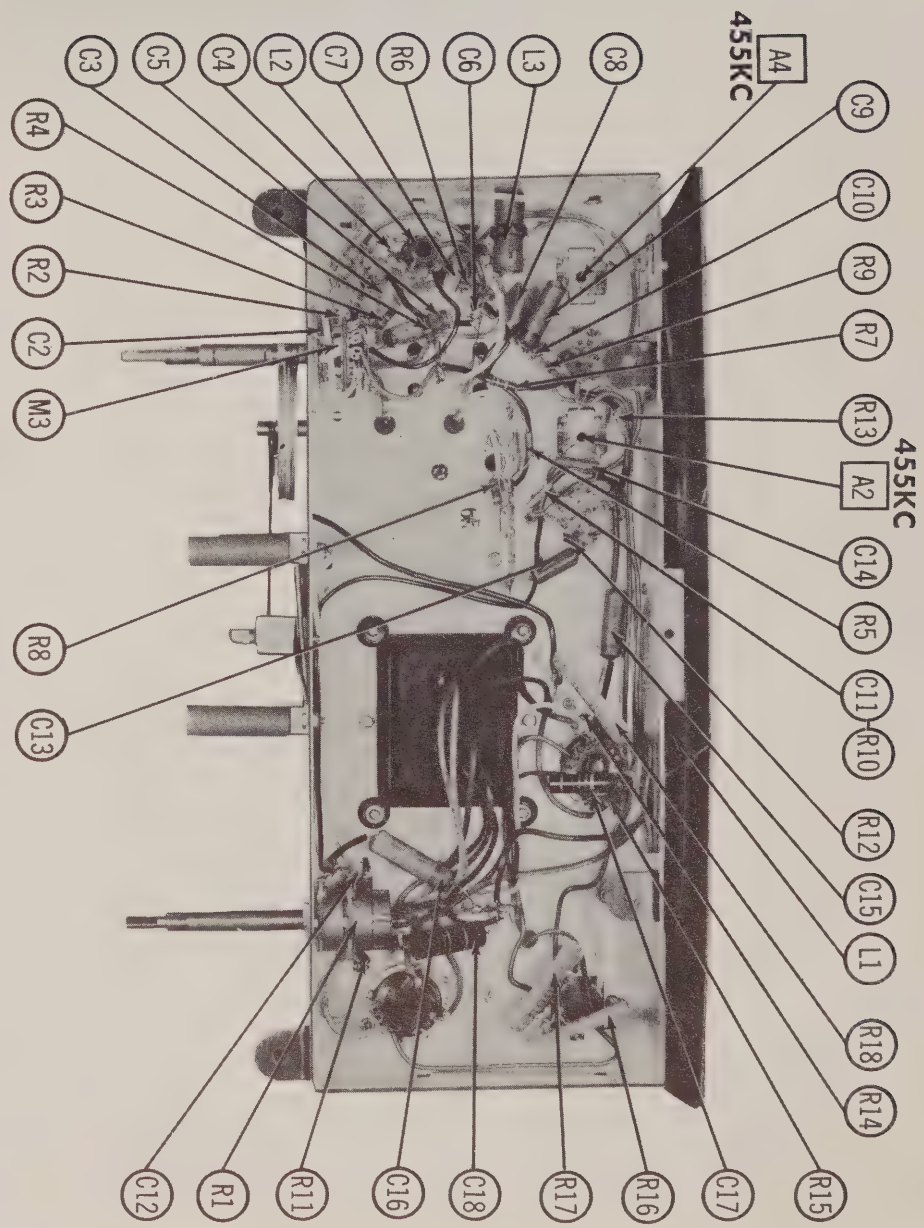
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Bayonet	46A-11971	Type #51 (2 used) (7.5V., .2 Amp., white bead)
M2	Tuning Capacitor	8A-21680	38-427, 38-427, 27-155MMF
M3	Switch	20A-12684	Radio-Phono Selector
	Cabinet	5C-20784-(A-113)	
	Background Plate	2C-20951-(A-113)	
	Escutcheon	5C-21872-S	
	Knob	5B-20947-(A-113)	Tone, Tuning (2 used)
	Knob	5B-20944-(A-113)	Function Selector
	Knob	5B-20945-(A-113)	Off/On Volume

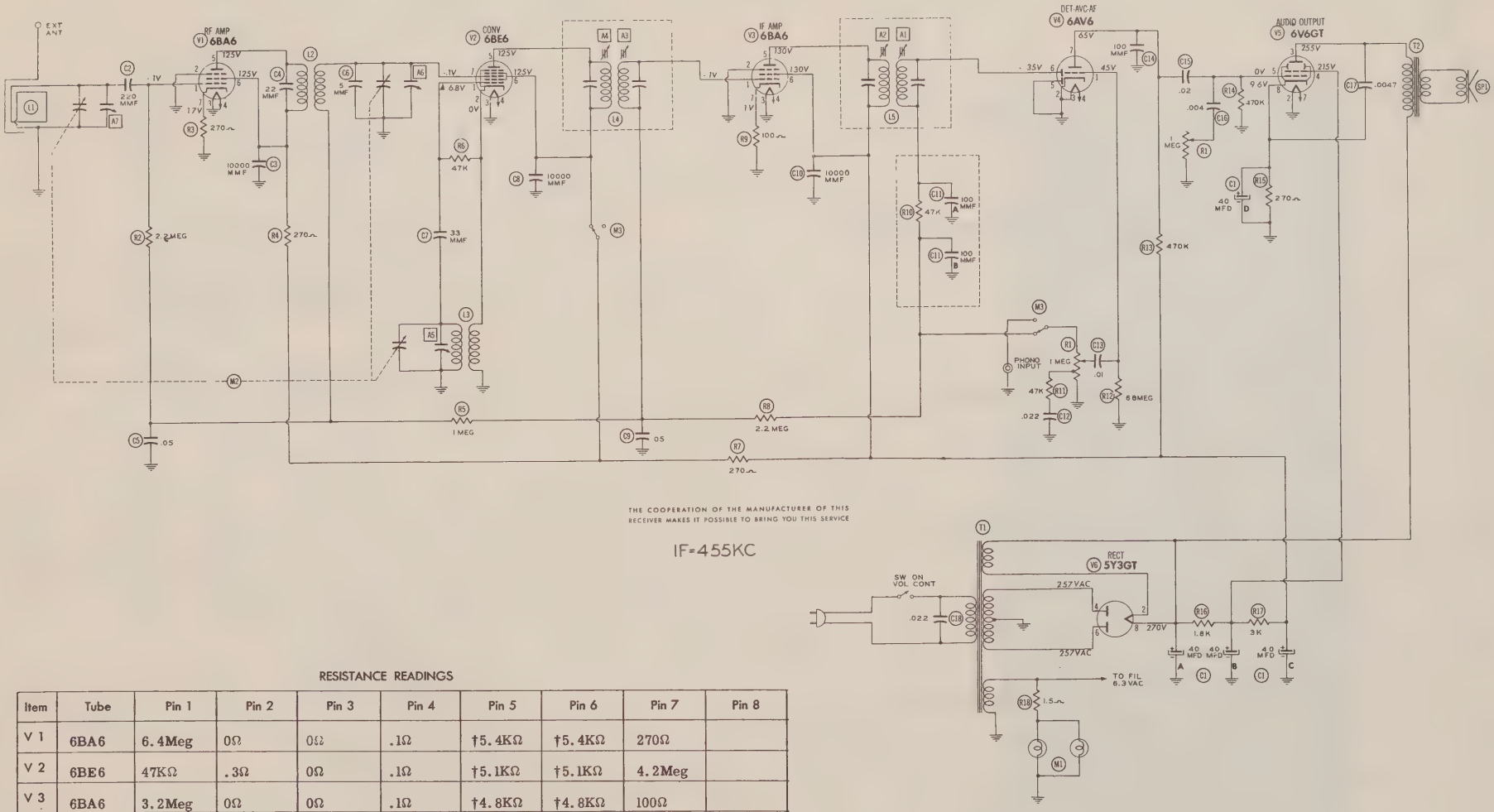


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2325-A



IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	6.4Meg	0Ω	0Ω	.1Ω	†5.4KΩ	†5.4KΩ	270Ω	
V 2	6BE6	47KΩ	.3Ω	0Ω	.1Ω	†5.1KΩ	†5.1KΩ	4.2Meg	
V 3	6BA6	3.2Meg	0Ω	0Ω	.1Ω	†4.8KΩ	†4.8KΩ	100Ω	
V 4	6AV6	6.8Meg	0Ω	0Ω	.1Ω	0Ω	1 Meg	†475KΩ	
V 5	6V6GT	INF	0Ω	†465Ω	†1.8KΩ	470KΩ	INF	.1Ω	270Ω
V 6	5Y3GT	INF	5 Meg	INF	138Ω	INF	147Ω	INF	5 Meg

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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205-11

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

WEBCOR
MODELS B-134-1, F-134-1

WEBCOR
MODELS B-134-1, F-134-1

TRADE NAME	Webcor Models B-134-1, F-134-1
MANUFACTURER	Webster-Chicago, 5610 W. Bloomingdale Ave., Chicago 39, Illinois
TYPE SET	AC Operated Audio Amplifier With 3 Speed Manual Record Player
TUBES (Three)	Types 12AT6 IF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .22 Amp @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

WEBCOR MODEL B-134-1

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		WEBCOR PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	53P013	12AT6	7BT	
V2	Audio Output	53P033	50C5	7CV	
V3	Rectifier	53P014	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	30P087	PRS150/50-30-20		EDL44215		3N532	TVA-3448	Red
B	40	150								Red
C	20	150								Blue
C2	10	25	30P064	PRS25/10		BR105		TC22	TVA-1204	
C3	.047	400	30P154	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C4	.0022	600	30P058	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C5	.0047	600	30P078	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C6	.01	400	30P155	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	.022	400	30P158	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C8	.047	400	30P154	489ZX-05		PJ4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	31P078		AG-63-Z	BSK-70-S	U-53	Tone
B	Shaft		Not Req.		KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.		SWB	Not Req.	US-26	Attach to R1A
R2A	1 Meg	½	31P055		AG-63-Z	BSK-70	U-53	Volume
B	Shaft		Not Req.		KSS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R3	4.7Meg	½	29M4752	BTS-4.7Meg	
R4	220KΩ	½	29M2242	BTS-220K	
R5	470KΩ	½	29M4742	BTS-470K	
R6	150Ω	½	29M1512	BTS-150	

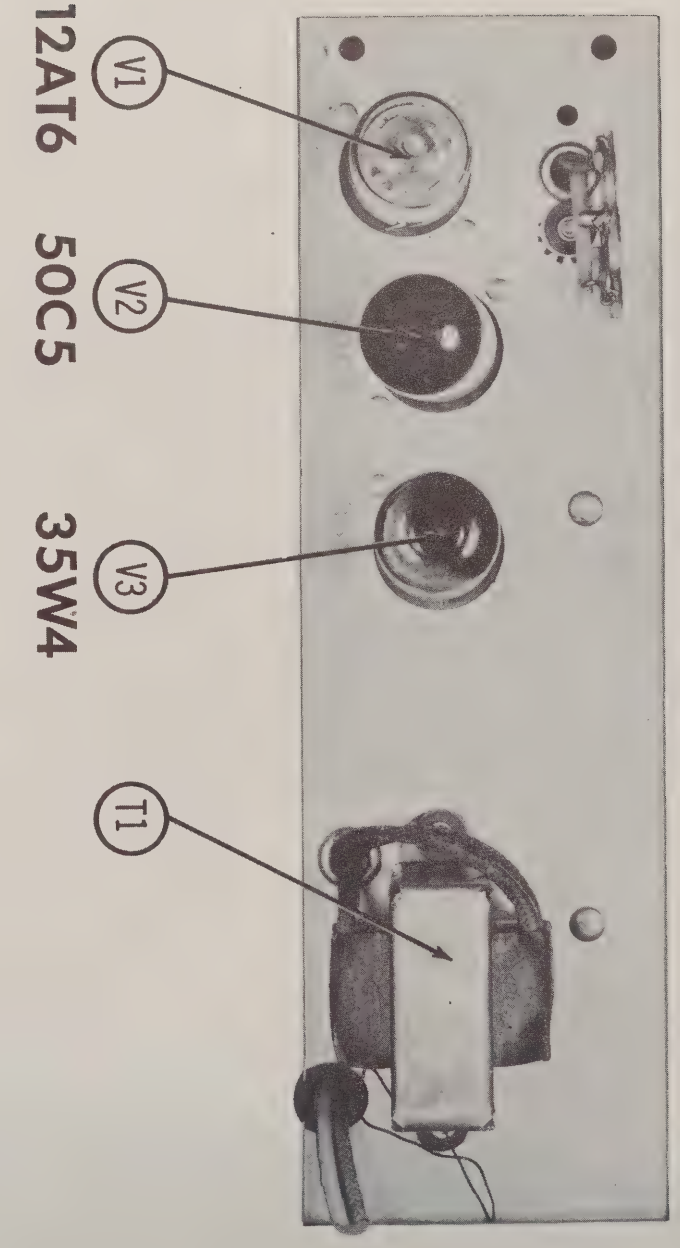
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R7	1200Ω	½	29M1222	BTS-1200	Note
R8	220Ω	½	29M2212	BTS-220	
R9	27Ω	½	29M2702		
R10	135Ω	6	29P052		

Note. Some models may use a 1000Ω resistor in this application. (Part No. 29M1022).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		WEBCOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	1.6KΩ	3.15Ω	154Ω	1.4Ω SEC 2 12.7Ω	67P017					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	WEBCOR PART No.	VIKING PART No.	QUAM PART No.	
SP1	4" X 6"	PM	3.15Ω	76PO22	46J6	46A1	

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	WEBCOR PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-C-LT	A1 A3	WC24T	A53MG A52A	H6-0T	0-1 0-3	

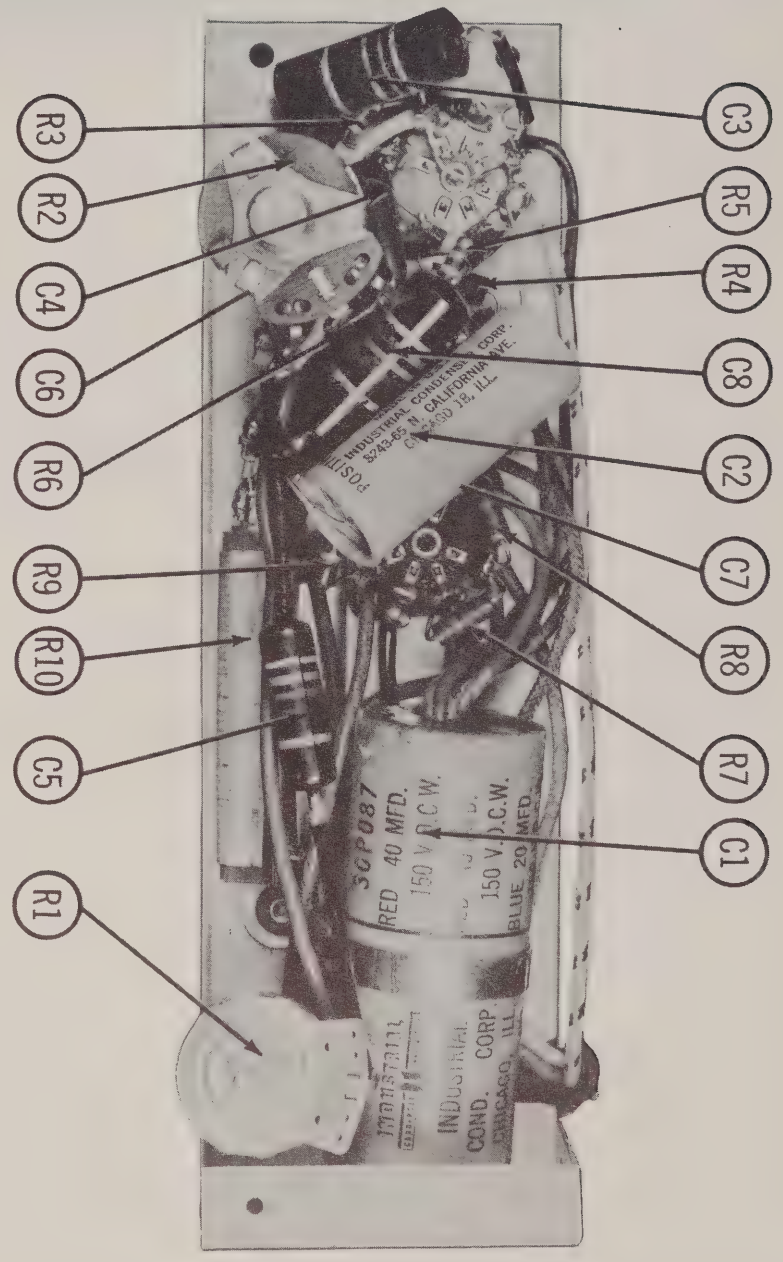
ASTATIC, SHURE AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW

PHONO NEEDLE

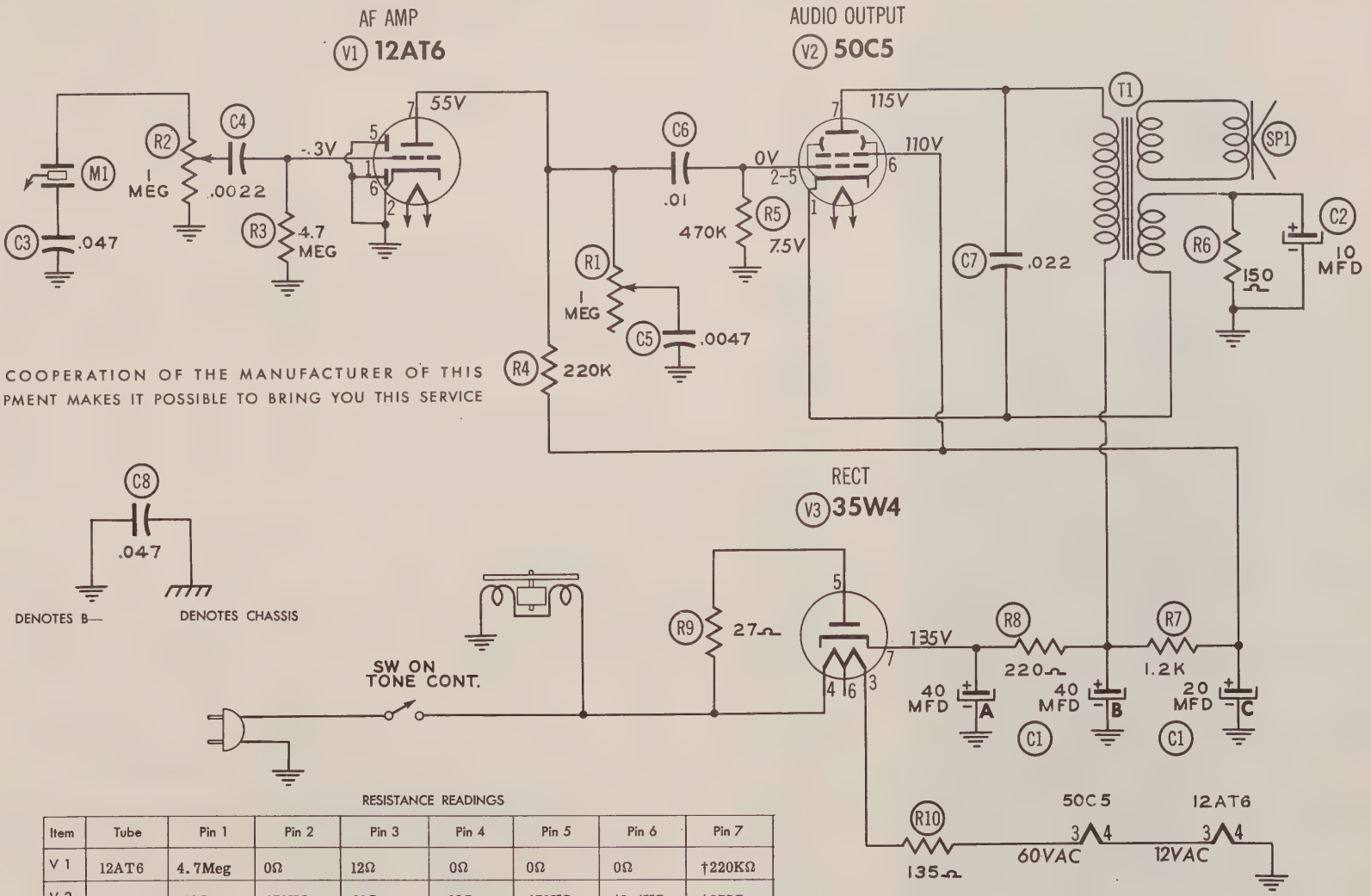
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	WEBCOR PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-5MGA or W-5MGS and W-5A or W-5S	A-75LP or A-85LP and A-75 or A-85	

CHASSIS—BOTTOM VIEW



WEBCOR MODEL B-134-1



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	4.7Meg	0Ω	12Ω	0Ω	0Ω	0Ω	†220KΩ
V 2	50C5	162Ω	470KΩ	60Ω	12Ω	470KΩ	†1.4KΩ	†375Ω
V 3	35W4	†220Ω	†1.4KΩ	195Ω	230Ω	257Ω	224Ω	140KΩ

† MEASURED FROM PIN 7 OF V3.
FILAMENT RESISTANCE MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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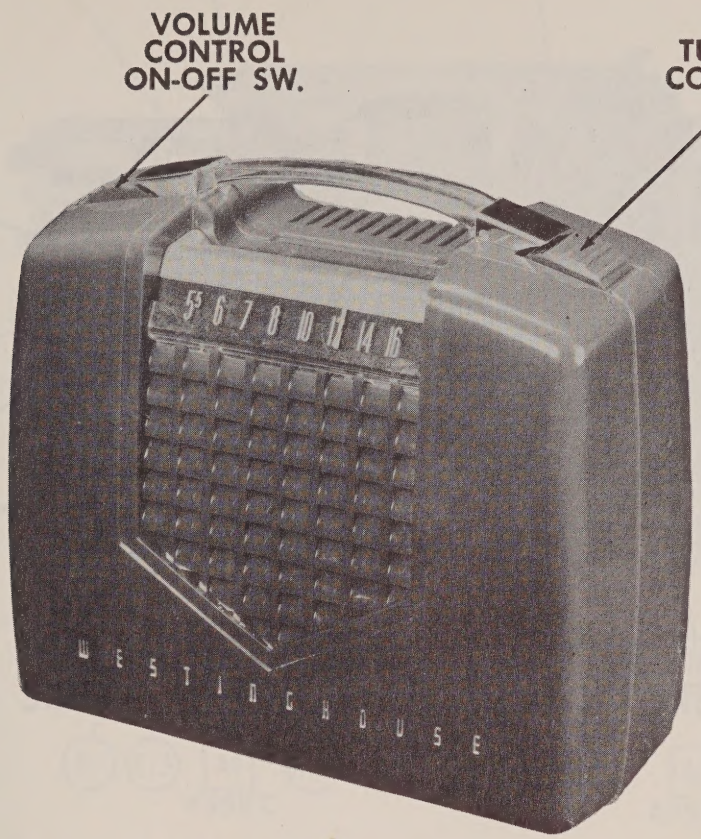
205-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained lat 117 Volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum , proper output load connected.

WESTINGHOUSE MODELS H-400P4, H-401P4, H-402P4, H-403P4 (Ch. V-2164-2)

WESTINGHOUSE MODELS H-400P4, H-401P4, H-402P4, H-403P4 (Ch. V-2164-2)



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3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Westinghouse Models H-400P4, H-401P4, H-402P4, H-403P4 (Ch. V-2164-2)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Sunbury, Pennsylvania
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 90 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC (or) 50MA @ 7½ Volts DC & 13MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use a isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tuning gang fully closed and set edge of pointer saddle ½inch from low frequency end of saddle bar.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator of tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTE
C1A	▬60	150	V-6552-2	E4D250					R1105	
B	■80	150								
C	▲40	150								
D	100	25								
C2	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	10000		V-9863-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C4	.1	200	RCP10W2104M	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C5A	150		V-9703-1	SI150	D6-151	TM5T15	GP2K-151	UC-5315		
B	.002			BPD-002	DD-202	TM5D2	801-002	DC-522		
C	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	34C4	
D	.005			BPD-005	MD-502	TM5D5	811-005	DC-525		
E	.005			BPD-005	MD-502	TM5D5	811-005	DC-525		
C6	2000		V-9863-2	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C7	.047	400	V-10157-4473M	489ZX-05		PJ4147		PT4147	4TM-S47	
C8	.05	200	RCP10W2503M	P288-05		PJ2S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	V-9993-3	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	RC20AE104M	BTS-100K	
R3	22KΩ	½	RC20AE223M	BTS-22K	
R4	3.3Meg	½	RC20AE335M	BTS-3.3Meg	
R5	47KΩ	½	RC20AE473M	BTS-47K	
R6	10Meg	½	RC20AE106M	BTS-10Meg	
R7	4.7Meg	½	RC20AE475M	BTS-4.7Meg	
R8	1 Meg	½	RC20AE105M	BTS-1 Meg	
R9	1 Meg	½	RC20AE105M	BTS-1 Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R10	680Ω	½	RC20AE681K	BTS-680	
R11	680Ω	½	RC20AE681K	BTS-680	
R12	1500Ω	½	RC20AE152K	BTS-1500	
R13	150Ω	4	V-6067-8		
R14	820Ω	½	RC20AE821K	BTS-820	
R15 A	1000Ω	10	V-10435-2		
B	1000Ω				

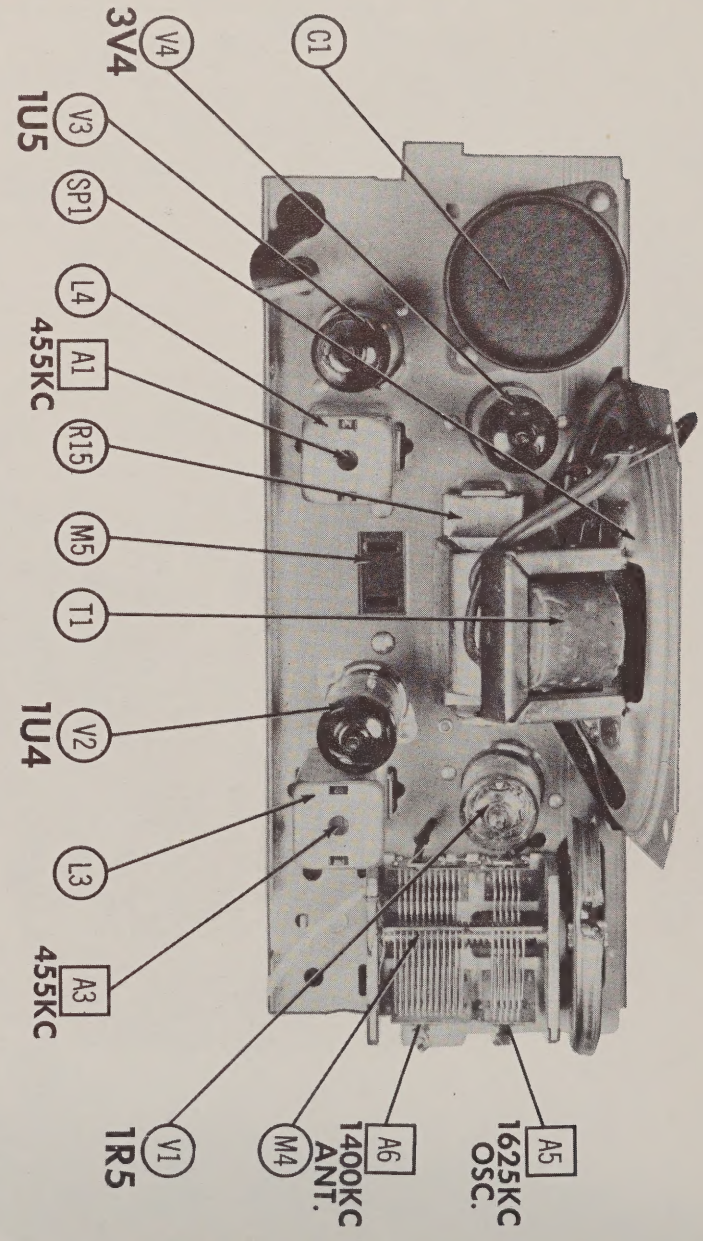
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9KΩ	3.3Ω	360Ω	.35Ω	Part of Spkr.	A-3329	A-2998		S-11X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.3Ω	V-10401-1	ST-113 Mod. P4-X	4A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Westinghouse PART No.	REPLACEMENT DATA MILLER PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L1	Loop Ant.	0Ω	.4Ω	V-10921-1			
L2	Osc. Coil	2.8Ω	12Ω	V-5661-2			
L3	Input IF	16.5Ω	17Ω	V-6972-5	12-C1	16-6758	
L4	Output IF	22Ω	23Ω	V-6972-6	12-C2	16-6758	

SELENIUM RECTIFIER

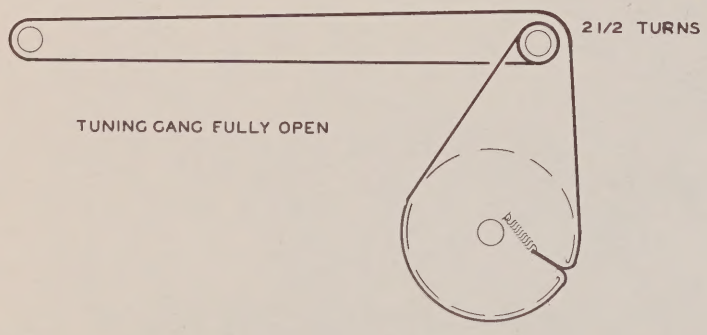
ITEM No.	RATING CURRENT	REPLACEMENT DATA Westinghouse PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.063ADC	V-9446-3	NA5	5M4	1002A	6S65	65

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	7½ V.		717			C5			
M3	90 V.			490			N60		

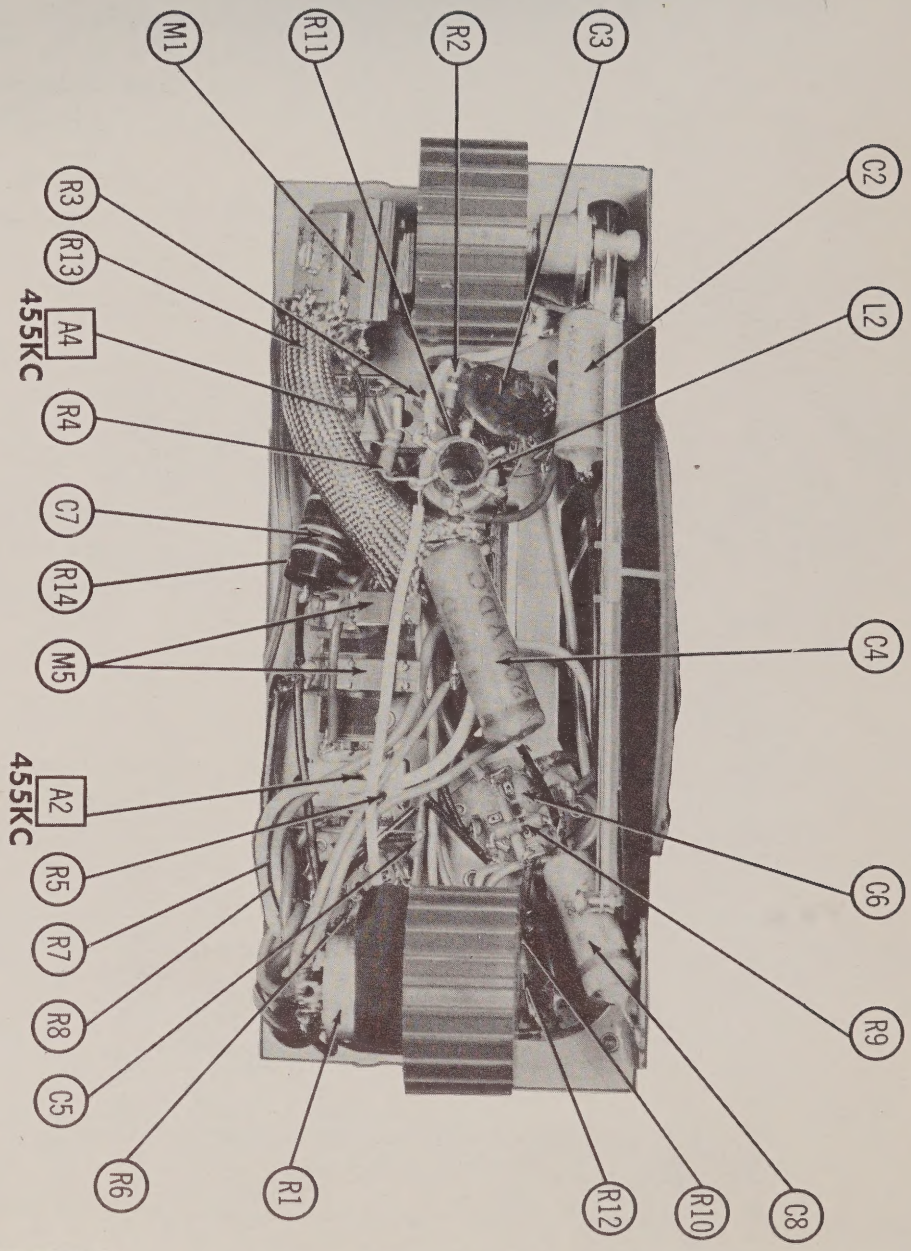
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuning Capacitor	V-10417-1	25-332MMF, 14-157MMF
M5	Switch(Line-Battery)	V-6565	
	Cabinet	V-1234-5	For Model H-400P4
	Cabinet	V-1234-6	For Model H-401P4
	Cabinet	V-1234-7	For Model H-402P4
	Cabinet	V-1234-8	For Model H-403P4
	Escutcheon, Dial	V-10853-1	
	Pointer, Dial	V-14022-2	
	Knob	V-10420-4	For Model H-400P4
	Knob	V-10420-5	For Model H-401P4
	Knob	V-10420-6	For Model H-402P4
	Knob	V-10420-7	For Model H-403P4



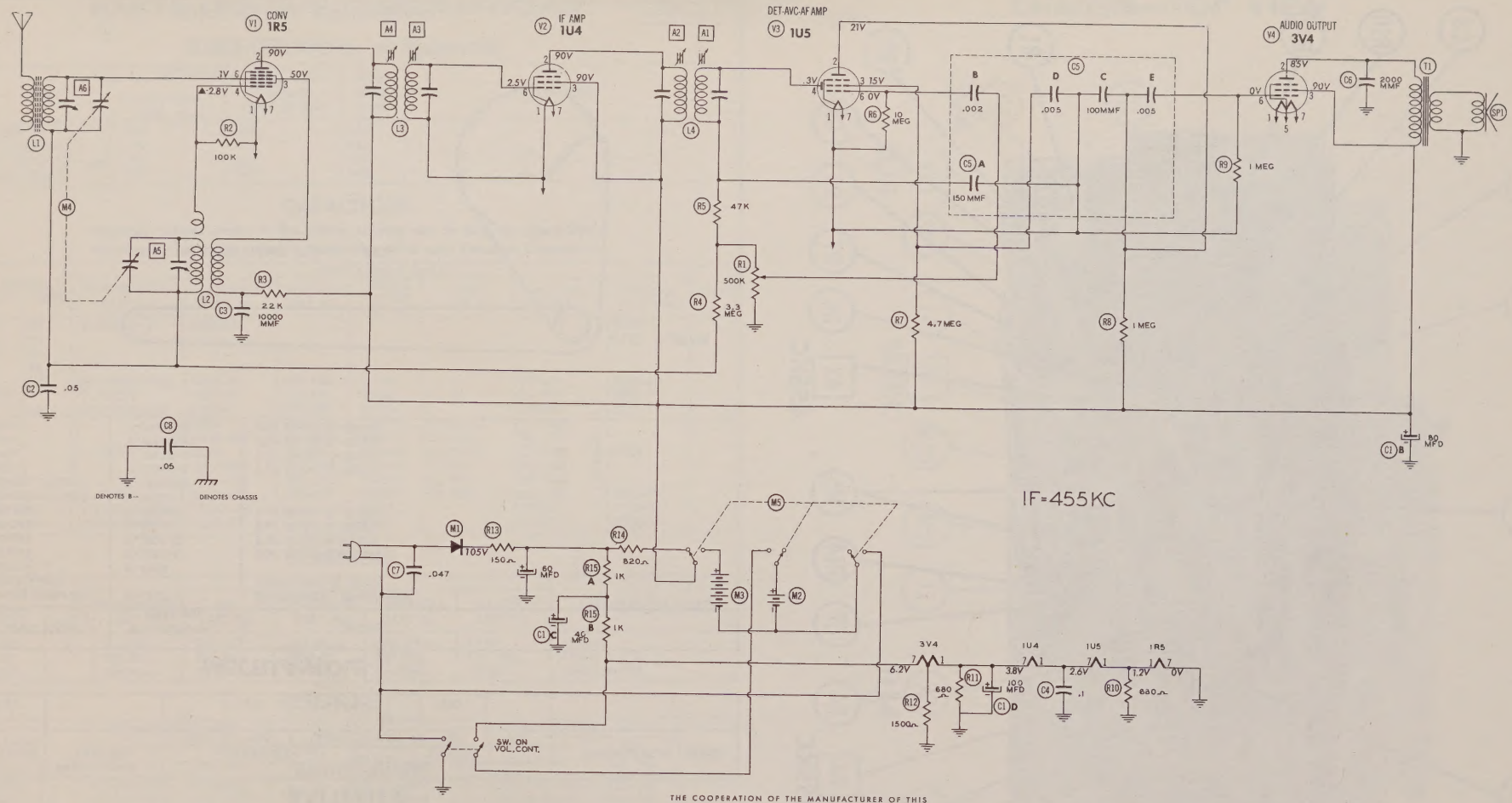
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



WESTINGHOUSE MODELS H-400P4 (Ch. V-2164-2)

WESTINGHOUSE MODELS H-400P4 (Ch. V-2164-2)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†970Ω	†22KΩ	100KΩ	0Ω	3.8Meg	*
V 2	1U4	*	†970Ω	†970Ω	†150Ω	0Ω	40Ω	*
V 3	1U5	*	†1 Meg	†4.7Meg	500KΩ	INF	10Meg	*
V 4	3V4	*	†1.4KΩ	†970Ω	0Ω	*	1 Meg	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMETER TO MEASURE FILAMENT RESISTANCE
▲ MEASURED WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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205-13

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.